SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1918.

No. 309.

WILLIAM F. BROTHERS, APPELLANT,

VS.

THE UNITED STATES.

APPEAL FROM COURT OF CLAIMS.

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1 I. *Petition—Filed May 26, 1915.*

In the United States Court of Claims.

WILLIAM F. BROTHERS
vs.
UNITED STATES. } No. 33072.

Petition.

To the Honorable the judges of the United States Court of Claims:

The petitioner, William F. Brothers, a citizen of the United States, residing in the city of Brooklyn, county of Kings, State of New York, respectfully shows:

First. That on and prior to July 18, 1895, the petitioner was the original and first inventor of a certain new and useful invention in cable crane with gravity anchor, not known or used by others in this country, before his invention and discovery thereof, and not patented or described in any printed publication in this or any foreign country, before his invention or discovery thereof, or more than two years prior to his application, and not in public use or on sale in this country for more than two years prior to his application and which had not been first patented, caused to be patented by him or his legal representatives or assigns in a foreign country upon an application filed more than twelve months prior to said July 18, 1895, that on July 18, 1895, the petitioner made application in writing to the Commissioner of Patents for a patent for said invention and filed in the Patent Office a written description of the same, and of the manner of making and constructing and using it, in such full, clear, concise and exact terms as to enable any person skilled in the art to
2 which it appertains or with which it is most nearly connected, to make, construct and use the same, explaining the principle thereof and the best mode in which he has contemplated applying that principle and particularly pointing out and distinctly claiming the particular improvement and combination claimed by him as his invention; and that the petitioner made the oath required in such cases to be made with said application in writing, that thereupon and upon payment of the fees required by law and other due proceedings had and on December 17, 1895, Letters Patent of United States No. 551614, bearing date as of said day and year, signed by the proper officials thereto duly authorized, were issued and delivered to Sarah E. Brothers and Myra A. Brown of Brooklyn, N. Y., and Plainfield, N. J., respectively, securing to them their heirs or assigns the sole and exclusive right to make to use and to sell the patented invention for the period of seventeen years from December 17, 1895, all as by said Letters Patent, or a duly certified copy thereof here in court to be produced will fully and at large appear.

Second. That by direct and mesne assignments in writing and duly recorded in the title records of the Patent Office at Washing-

ton, D. C., the petitioner acquired and now enjoys and owns the entire right, title and interest in, to and under said Letters Patent, together with the right to sue for and collect, either at law or in equity, royalties or damages or both for the past infringement thereof, all as will more fully and at large appear in and by said instruments in writing, or certified copies thereof in court to be produced.

Third. That the Panama Canal Commission in the construction of the Gatun Locks, advertised, under Circular #414, dated January 4, 1908, for bids for the installation of cableways to be used in the construction of said locks, which, according to the published specifications shall, among other requirements, have fixed steel booms projecting a sufficient distance to give a maximum clear run of twenty-eight feet beyond the dock and each bucket shall operate the entire length of the span; and which circular provided for the submission of bids for a special or alternative design of cableway providing overhanging booms on the head towers to enable loads to be lifted in the rear of the towers instead of in front of the towers, thereby avoiding the necessity of material to be handled being required to be transported across the delivery or tower tracks to the point from which such material is to be handled by the cableway.

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Fourth. That the petitioner, William F. Brothers, in the name of "Balanced Cable Crane Company" submitted his bid for this work as advertised, covering both the straight requirements of the specifications of said circular and also the alternative design specified, which said bid was accompanied by full plans and specifications and the required bond, together with the statement that the structure submitted in said bid was covered and protected in and by said patent, which said bid was the lowest of all bidders under said circular.

Fifth. That the Panama Canal Commission, over the protest of the petitioner, rejected all bids submitted under said Circular #414 and re-advertised for new bids for cableways under Circular #455, dated July 8, 1908.

Sixth. That the petitioner, William F. Brothers, in the name of "Balanced Cable Crane Company" submitted his bid under said Circular #455, accompanied by the required plans and specifications and bond and in connection therewith attention was called by the petitioner to the fact that the apparatus was protected in and by said patent.

Seventh. That the contract for said cableway installation to be furnished under Circular #455, as the petitioner is informed and believes, was awarded to Lidgerwood Manufacturing Company of New York, N. Y., which company, under said award proceeded to install thirteen cableways for use in connection with the construction of said Gatun Locks of the Panama Canal, over the protest of the petitioner.

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Eighth. Upon information and belief the petitioner avers that said cableways furnished by said Lidgerwood Manufacturing Company under said Circular #455, were installed during 1909 and 1910 and that in the latter part of 1910, during 1911 and 1912, said apparatus as installed was altered and changed in the method of its operation in such manner as to utilize the invention patented in and by said patent No. 551614, granted December 17, 1905, said change in structure and mode of operation being effected, as petitioner is informed, by the officials of the Panama Canal Commission.

Ninth. That upon the discovery of said infringement the petitioner brought suit against the Lidgerwood Manufacturing Company for damages in the sum of One hundred and thirty-seven thousand six hundred dollars ($137,600) in the United States District Court for the Southern District of New York for the said infringement of his patent.

Tenth. That upon the action of the trial judge in said suit directing a verdict for the Lidgerwood Manufacturing Company after proofs of the parties had been submitted the petitioner sued out a writ of error to the United States Circuit Court of Appeals for the Second Circuit to review the action of the trial judge in directing a verdict for the Lidgerwood Manufacturing Company, which Court of Appeals rendered and handed down its opinion dated March 9, 1915, holding the said patent No. 551614 to be valid and a pioneer in the art and entitled to a broad scope of interpretation and that it covered broadly the structure of tilting tower in which a gravity anchor alternately yields and overcomes the load embodied in the cableway structure as altered and used by the officials of the Panama Canal Commission and complained of as the infringement, and that as the Government was the infringing user of the meritorious invention of said patent and had appropriated said invention without the consent of the petitioner the action for the infringement complained of should be against the Government.

Wherefore, your petitioner respectfully prays for judgment against the said United States; that it account to your petitioner for the royalties and damages which the petitioner has sustained by reason of its infringement and infringing act complained of, and that your petitioner have judgment against said United States in the sum of One hundred and thirty-seven thousand six hundred dollars ($137,600) said amount being the damages suffered and sustained by the petitioner by reason of the loss sustained by the petitioner in the rejection of his bid for supplying said cableway installation, together with interest thereon from the date the infringing act by the Government commenced, and that your petitioner have such other further relief as to the Court may seem just.

WILLIAM F. BROTHERS.

SAMUEL E. DARBY, *Attorney.*

STATE OF NEW YORK,
County of New York, ss:

On this 22nd day of May, 1915, personally appeared William F. Brothers, the above named petitioner who being duly sworn, deposes and says that he is the petitioner hereinabove named, that he has read the foregoing petition and knows the contents thereof; and that the same is true of his own knowledge, except as to the matters therein stated to be alleged on information and belief and as to those matters he believes it to be true.

WILLIAM F. BROTHERS.

Sworn to and subscribed before me this 22nd day of May, 1915.

WALTER A. DARBY,
Notary Public, New York County, No. 879.

6 II. *General traverse.*

Court of Claims.

WILLIAM F. BROTHERS,
vs.
THE UNITED STATES. } No. 33072.

No demurrer, plea, answer, counterclaim, set-off, claim of damages, demand, or defense in the premises, having been entered on the part of the defendants, a general traverse is entered as provided by rule 34.

7 III. *Argument and submission of case.*

On May 29, 1917 this case was argued and submitted on merits by Mr. Samuel E. Darby for the claimant and Mr. H. C. Workman for the defendants.

IV. *Findings of fact, conclusion of law, opinion of the court and appendix.—Filed June 14, 1917.*

This case having been heard by the Court of Claims the court upon the evidence, makes the following

Findings of fact.

I.

On July 18, 1895, William F. Brothers, the claimant in this cause, filed in the United States Patent Office an application for a patent for "improvements in cable cranes with gravity anchors," upon which application Letters Patent No. 551614 were granted and issued, under date of December 17, 1895, to his assignees, Sarah E.

Brothers and Maria A. Brown; which letters patent, including specification and drawings, appear in the appendix to these findings.

II.

The following described patents, publications, and structures were in and a part of the cableway art at the time of the claimant's said application for, and the allowance and granting of, his said Letters Patent No. 551614.

French patent to Pluchet, dated January 4, 1851, and additions thereto.

French patent to Sassiat, dated June 19, 1852, and additions.

United States patent to Brown, No. 302705, dated July 29, 1884.

United States patent to Brown, No. 300689, dated June 17, 1884.

United States patent to Earth, No. 325328, dated September 1, 1885.

United States patent to Torres, No. 398097, dated February 19, 1889.

United States patent to Westerlund, No. 358517, dated March 1, 1887.

United States patent to De Camp, No. 469908, dated March 1, 1892.

The publication Engineering, of London, England, for June 2, 1882, pages 551–552.

The French publication Revue Industrielle des Mines, for the year 1888, Volume III, pages 49–65, and drawings.

8 The French publication Annales des Mines, for the year 1886, Volume X, pages 185–205, and drawings.

The French publication Annales des Ponts Chaussee, for the year 1887, Volume XIV, pages 632 et seq., and drawings.

The cableways used in the construction of the Chicago Drainage Canal, beginning in May or June, 1893, were of the counterweighted rigid tower and fixed span type shown by the Pluchet and Sassiat patents noted above, and the towers proper of which occupied the front or canal side of an extended truck-mounted platform or base, heavily counterweighted with stone at its rear side, and to which counterweighted rear of the platform or tower base the cable was extended from the top of the tower and firmly anchored.

The above-described patents and publications are, by this reference thereto, made a part of this finding, as exhibits hereto.

III.

Subsequent to the claimant's assignment to other parties, in August, 1895, of his interest in his said application for letters patent and after numerous conveyances of said letters patent, they were conveyed to the claimant by deed of assignment under date of October 2, 1912, two and a half months prior to their expiration by limitation, on December 17, 1912.

Among the different owners of said patent prior to its said assignment to the claimant was the Balanced Cable Crane Co. (Inc.), of the State of Maine, which company acquired title to the patent by deed of assignment of September 21, 1906. Said company, during its ownership of the patent, went into bankruptcy, and this patent, together with other patents belonging to the company, was, on February 7, 1911, sold and conveyed by the trustee in bankruptcy of said company to one George Doan. At the time of said sale and conveyance by the trustee in bankruptcy said patent No. 551614 was encumbered by a mortgage and lien in favor of the company's bondholders. The patent was sold and conveyed by the trustee to Doan, "subject, however, to any and all existing liens, mortgages, deeds of trust, bond and rights of bondholders, and other encumbrances existing upon or against or affecting said patent rights in any manner." Said mortgage and liens are not shown to have yet been discharged or released. Said patent was, on February 27, 1912, conveyed by Doan to one Ivan E. Konigsberg, by whom it was conveyed to the claimant, as set forth above, on October 2, 1912.

IV.

Under date of January 4, 1908, the United States Isthmian Canal Commission advertised for proposals for the construction and installation, in accordance with certain general specifications, of a number of cableways for use in the construction of the Panama Canal, the commission reserving the right to reject any or all proposals submitted. In response to said advertisement a number of proposals were received, among which was a proposal by the Balanced Cable Crane Co., which company was at that time the owner of the said Brothers patent No. 551614 and whose proposal was for the type of cableway disclosed by said patent.

9 The proposal of said company was the lowest in price of the proposals received. The cableways proposed by said company not being considered by the commission to be satisfactory or suitable for the work to be performed by them, said proposal was rejected. All other proposals received in response to the said advertisement were also rejected. New proposals were, under date of July 8, 1908, advertised for under modified specifications, which were intended to exclude, as unsuitable, the type of cableway shown by the said Brothers patent.

Said Balanced Cable Crane Co. again submitted a proposal based upon the said patented cableway, but the bid was awarded to the Lidgerwood Manufacturing Co., which supplied the rigid-tower fixed-span cableway that was used. The proposal of the Lidgerwood Manufacturing Co., of New York, being accepted the said company thereupon proceeded, during the years 1908 to 1910, to construct and install the one single cableway and the six duplex, or double, cableways complained of by the claimant in this suit as infringing his said

patent No. 551614, and which cableways were used by the commission during the years 1909 to 1913 in the construction of said canal.

The general type and form of the cableways used by the defendants is shown by drawings marked, respectively, "A" and "B" in the appendix to these findings.

V.

The single and the duplex cableways were similar in general design and construction except that the towers of the former supported a single cable, while those of the latter supported two cables, parallel to each other, at a distance of 18 feet apart, and each operated independently of the other, the length of the towers longitudinally of the canal cut being of proportionate dimension for the accommodation of the two cables. The towers were of structural steel construction; and taking the duplex cableways for illustration, each tower in vertical cross section from front to rear was in the shape of a right-angle triangle, with a base of approximately 50 feet, a perpendicular or vertical height of about 85 feet, and a hypothenuse of about 98 feet, with a length of about 38 feet longitudinally of the canal. The two towers of the cableway stood facing each other, on opposite banks of the canal cut, with their hypothenuse faces toward the cut. The cable span across the cut between the tops of the towers was approximately 800 feet. The cables used were 2¼-inch steel-wire cables having a rated breaking stress of 200 tons. The cables were supported by headblocks or saddles at the tops of the towers, and their ends were carried down and firmly anchored to the counterweighted bases of the towers.

Rigidity of the towers was desired; and in order to secure this and hold the towers rigid against any tendency to tip, tilt, or yield under the stress of the suspended cables and their loads, the platform base at the rear side of each tower—that is, the side farthest from the canal cut—was counterweighted by a block of cement concrete of over 150 tons weight, cast about the structural steel members of the base of the tower and extending along practically the entire length of the base. The entire weight of each tower, including the tower proper, the trucks upon which it was mounted, and the concrete counterweight, was upward of 500 tons.

To facilitate the shifting or moving of the cableways along the canal cut as the work progressed each tower was mounted upon sets of trucks, similar to the trucks of railway cars, on the front and rear sides of the base of the tower, and the whole structure was mounted upon two standard-gauge railway tracks located on the bank of the canal cut at the proper distance from each other and from the similar tower tracks on the opposite bank of the cut.

The cableways were operated by electrical power from the machinery stations in the head tower of each cableway.

VI.

Subsequent to the construction and installation of said cableways they were maintained and operated without change in structural form or method of operation other than that as the height of the walls and other work of the canal increased, beginning about August, 1910, it became necessary, in order to admit of the loads being carried to pass clear of the works and men engaged thereon as the height of the work increased, to take up the slack or decrease the deflection of the cable. The cables were accordingly drawn up for said purpose. This tightening up of the cables or reduction of their deflection increased the effect of the load and weight of the cables upon the towers as regards their tendency to yield or tilt.

VII.

It was the intent and purpose of the engineer officers of the Canal Commission, by and under whom said cableways were designed, constructed, and operated, that the towers thereof should be rigid and nonyielding to the full extent that rigidity in cable towers was possible; and there was no tilting or yielding of said towers other than such as resulted from a yielding of the roadbed of the tracks supporting them, portions of which roadbed consisted of "fills" of excavated materials upon swampy ground. There is no satisfactory evidence that the towers either yielded or tilted at any time during the period of claimant's ownership of said letters patent.

Conclusion of law.

Upon the foregoing findings of fact the court decides, as a conclusion of law, that there was no infringement of claimant's patent, and his petition should be, and the same is hereby, dismissed. Judgment is rendered in favor of the United States against the claimant for the cost of printing the record in this cause in the sum of eight hundred and ninety-three dollars and seventy-five cents ($893.75).

Opinion.

Per Curiam:

The plaintiff had assigned his application for a patent for "improvement in cableways on gravity anchors," and after letters patent had been issued and had been assigned to various parties he became the owner of said letters patent about two and a half months before their expiration by limitation in 1912. It is essential that any
11 right of action he has be confined to said two and a half months' time. There could be no assignment of any claim against the Government to him arising prior to the time he became the owner of the letters patent. (Section 3477, Revised Statutes.)

The Court of Claims did not have jurisdiction of claims for infringement of a patent by the United States until the act of June 25, 1910, 36 Stats., 851. Any jurisdiction which the court now has is subject to the limitations of that act. It is therein expressly provided that the Court of Claims shall not entertain suits "based on the use by the United States of any article heretofore owned, leased, used by, or in the possession of the United States." The cableways complained of in this action were used by and in the possession of the United States prior to June 25, 1910. In order to meet the question thus presented the plaintiff claims that subsequent to June 25, 1910, the Government materially altered the cableways being used by it in such a way as to make them infringe his patent. That result is said to flow from the fact that the Government decreased the deflection of the cables; that is, tightened them up, and that by so doing in connection with the loads they carried the towers were caused to yield or tilt and thereby to become in essence towers such as plaintiff's patent contemplated and covered. The cableways designed by the Government and used by it were intended to be rigid. So far from being like plaintiff's design they were intended to be different from it, and they were different. There can be no question that as constructed and used generally the said cableways used by the Government did not infringe plaintiff's device. That he had a meritorious device may be conceded. (Brothers v. Lidgerwood Mfg. Co., 223 Fed. Rep., 364.)

During the course of the defendants' work on the Panama Canal and the use of its cableways it was found necessary to tighten the cableways so as to admit of the carriage of loads over and free of the work being constructed, and the cables were accordingly tightened. This was done in the orderly conduct of the work upon which the Government was engaged. The railroad tracks upon which the base of the tower rested were built parallel with the canal cut and were at times constructed upon fills resting upon swamp or soft ground. These conditions may at times have caused a yielding of the tower under the stress of the load upon the cableways; and if that fact be conceded the question is, would the act of the Government in making the change suggested amount to an infringement of plaintiff's patent? As above stated, there was not intention on the part of the Government to allow its cableways to yield or tilt. As changed they did not amount to a mechanical equivalent, and in the absence of such an intention and mechanical equivalent it can not be said that the changes which the Government made and the results which followed, largely on account of the character of the foundation, would amount to an infringement. If the changes in the cables or the addition to the loads thereon could convert the Government's cableways into a device embodying the essential features of plaintiff's device, that fact would demonstrate the invalidity of plaintiff's patent because of the prior state of the art. Intended as they were to be rigid and designed as rigid towers, well known in the art, the circumstances that from an overburden they might at times yield or tilt

some, would be but a demonstration of the well-known fact that even a rigid tower may tilt before it collapses, and that it will
12 topple over or collapse under sufficient stress. If plaintiff's claim be so construed as to prevent the use of a rigid tower which under any state of circumstance may yield or tilt to some extent, then his claim in that regard would be too broad to give it validity.

Plaintiff's petition is plainly based upon an alleged infringement, but it was suggested in argument that if he can not recover for an infringement he may recover upon an implied contract. Plainly the two positions are inconsistent and the same facts do not give a right of action for both. The plaintiff protests that the Government had no right to use his device, and he can not recover upon an implied contract unless he consented to such use. (Russell's Case, 12 U. S., 516; Healy v. Sea Gull Specialty Co., 237 U. S., 479, 480.)

The evidence is very conflicting as to whether the tower, after the deflection of the cables was lessened, tilted or yielded at all. If they did so it was the result of accident and not of design. The evidence does not show any tilting or yielding of a tower during the period of plaintiff's ownership of the patent.

We think plaintiff has not shown an infringement of his patent and that there can be no recovery as upon an implied contract. The petition will therefore be dismissed.

13 Appendix.

No. 551614. The United States of America.

To all to whom these presents shall come:

Whereas William F. Brothers, of Brooklyn, New York, has presented to the Commissioner of Patents a petition praying for the grant of letters patent for an alleged new and useful improvement in cable cranes with gravity anchors, he having assigned his right, title, and interest in said improvement to Sarah E. Brothers, of same place, and Maria A. Brown, of Plainfield, New Jersey, a description of which invention is contained in the specification of which a copy is hereunto annexed and made a part hereof, and has complied with the various requirements of law in such cases made and provided; and

Whereas upon due examination made the said claimant is adjudged to be justly entitled to a patent under the law;

Now, therefore, these letters patent are to grant unto the said Sarah E. Brothers and Maria A. Brown, their heirs or assigns, for the term of seventeen years from the seventeenth day of December, one thousand eight hundred and ninety-five, the exclusive right to make, use, and vend the said invention throughout the United States and the Territories thereof.

In testimony whereof I have hereunto set my hand and caused the seal of the Patent Office to be affixed, at the city of Washington, this

seventeenth day of December, in the year of our Lord one thousand eight hundred and ninety-five, and of the independence of the United States of America the one hundred and twentieth.

[SEAL.] JNO. M. REYNOLDS,

gravity-anchor.

Assistant Secretary of the Interior.

Countersigned:

JOHN S. SEYMOUR,

Commissioner of Patents.

United States Patent Office. William F. Brothers, of Brooklyn, New York, assignor to Sarah E. Brothers, of same place, and Maria A. Brown, of Plainfield, New Jersey. Cable-crane with

[Specification forming part of Letters Patent No. 551,614, dated December 17, 1895. Application filed July 18, 1895. Serial No. 556,327. (No model.)]

To all whom it may concern:

Be it known that I, William F. Brothers, a citizen of the United States, residing at Brooklyn, Kings County, New York, have invented certain new and useful Improvements in Cable-Cranes with Gravity-Anchors, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

14 The object of this invention is to facilitate the erection and operation of a suspension-cable in situations where a suitable anchorage could not be obtained for one or both ends of the cable; and the invention consists in combining a tension-weight upon the end of the cable with an inclined sheers or post adapted to transform the vertical tension of the weight into a horizontal tension upon the cable.

By this invention an anchorage for a cable may be erected either temporarily or permanently with very slight expense and may be employed in many situations, as in the surf upon the seashore, where a permanent anchorage could only be maintained with great expense and difficulty. By inclining the sheer-poles and weighting their upper ends, the tension of the cable is converted into a thrust at the lower ends of the sheers; but I have termed the device a "gravity-anchor," as it depends for its efficiency entirely upon the operation of gravity. The suspending-cable, having its outer end supported and anchored above the water upon a post or sheers at some distance from the shore, may be used with great advantage at life-saving stations during the stormy portion of the year to convey a life-boat over the surf into the still water. As repeated unsuccessful attempts are often made to launch life-boats in rough weather, great delay and loss may be avoided upon occasions where it is necessary to promptly assist vessels in distress by thus launching the life-boat without encountering the surf.

The anchorage constructed according to my invention may also be made movable by supporting the sheers upon a suitable car or truck mounted movably upon a track, which in such case is preferably inclined to sustain the thrust at the base of the sheers. Such a movable anchorage may be used in excavating a large area to shift the end of a cable around the periphery of a circle, thus enabling a single cable if fastened to a suitable abutment in the center of the circle to sweep over the entire surface of the same and to sustain and shift a cable-crane or similar hoisting device over the entire circular area.

The invention will be understood by reference to the annexed drawings, in which—

Figure 1 is a diagram representing in elevation a suspending-cable anchored adjacent to an ocean beach with a carrier and boat suspended therefrom. Fig. 2 is a plan of the same. Fig. 3 is a side elevation, partly in section where hatched, of the improvements applied to a cable-crane with movable anchorage. Fig. 4 is a plan of the same. Fig. 5 is an elevation of a portion of the cable with the carrier and hoisting devices thereon. Fig. 5^a is a section of the cap b^4 on an enlarged scale. Fig. 6 is a diagram showing the connections at the top of the sheers for the cable end and the gravity-load; and Fig. 7 is a diagram showing the compensating effect of the gravity-anchor, with an indication, by dotted lines, of the carrier and cable in different positions.

In Figs. 1 and 2, A designates the cable, B the fixed abutment, and C the fixed anchorage. D designates the sheer-poles, two being preferably used and braced toward one another at the top, where they are united by a cap E.

Figs. 1 and 2 represent an arrangement suitable for launching a life-saving boat, S designating the shore, W the water adjacent thereto, and S′ the bottom below the water, upon which the sheer-poles are set. The sheers are set at an angle, of preferably forty-five degrees, to the cable, and a platform or pan F is suspended from the cap E and loaded with tension-weights G. Sand or stones may be readily employed for such weight, by making the platform of suitable strength and dimensions. A carrier H is shown suspended upon the cable by a frame with wheels I, and a boat J is shown supported beneath the carrier by hanger-ropes b, hanger-frame b′, and hoisting-ropes c. The ropes c would be wound upon drums in the carrier H. These parts are shown in dotted lines adjacent to the shore abutment B with the boat hoisted to clear the breakers indicated by the elevation W′ upon the water, and the boat is shown in full lines, lowered upon the water adjacent to the sheer-poles D beyond the breakers, where the boat can be launched with safety. The means for suspending the boat may be entirely detachable, so that they can be cast off as soon as the boat is in the water and the boatmen have their oars extended. Means to prevent the boat from twisting upon the rods c, or from being displaced by the wind when in the transportation upon the cable, may be used, if desired; and such means may consist of a guide-arm d, attached to one side of the carrier H and

provided with a wheel d′ to ride upon the cable. An arm or pole e is attached to one end of the boat beneath the arm d, and its outer end is attached to a cord f, which is extended over a pulley g upon arm d to a drum upon the carrier H. The ropes c and f are wound and unwound simultaneously, and the guides d and e serve to keep the boat from swinging when it is raised or lowered.

The carrier may be made of any suitable construction and propelled upon the cable by any suitable power. A construction is indicated in Fig. 5, which is substantially the same as that in my application, Serial No. 457116, filed January 3, 1893, and designed for use with an electric motor. In this construction, the wheels I are shown journaled directly upon a frame H′, which sustains an electric motor K and suitable gearing to rotate the wheels I and hoisting-drums c′. A seat L for an operator is shown affixed to the side of the carrier in proximity to handles M M′, which are adapted to connect a friction-wheel m upon the motor-shaft n at pleasure with the gearing of the wheels I or the hoisting-drums c′. The poles D are shown in Fig. 1 stepped in the bottom S′, but projected therefrom sufficiently to bend freely under the strain of the cable and the tension-weight G.

With the sheer-poles set an angle of forty-five degrees to the cable, the weight of the poles, if permitted to yield, exerts a very material tension upon the cable independently of the tension-weight, and the latter may be proportioned to produce the additional tension required to strain the cable in the required degree. Such tension-load may be computed, if required to transport over the turf a boat which, with the boatmen and the carrier H, would weigh two thousand pounds. The deflection of the cable in such case would be made a given proportion of its length, and the tension-weight would be made correspondingly greater than the load upon the cable.

The tension-weight, with the sheer-poles, constitutes an anchorage which may be planted at any point to produce the required tension upon the cable, and thus avoid the necessity of an anchorage in the earth. It is well known that the tension at the ends of a suspending-cable is much greater with a given load at the middle of the cable than when the load is close to either abutment, and my im-
16 proved anchorage varies the angle of the cable in proportion to the load, if the sheer-poles be so made as to support the load and also yield under variations of the tension.

Fig. 7 illustrates in diagrammatic form the changes of angle in the cable, the parts being indicated in solid lines with the load in the middle of the cable, and in dotted lines with the load close to the sheer-poles. In the latter position the slack of the cable is partially taken up by the tension-weight, and the sheer-poles are bent outwardly from the fixed abutment, thus holding the cable at a smaller angle with its abutment than would be the case if the sheer-poles were rigidly fixed and the slack of the cable were unchanged during the shifting of the load. I have found that with the use of the flexible sheer-poles and the tension-weight G, the angle of the cable to the horizontal line at the cap E is substantially the same for all

positions of the load, as is indicated by the parallelism of the full lines and dotted lines adjacent to the cap E.

In Fig. 7 the base of the sheer-poles D is attached to a log or axle D^2 arranged to rock or oscillate in bearings D^3, to assume the various positions required; but the poles are adapted to move through the small angle required in practice if stepped in or on a flat beam, as shown at D^4 in Fig. 3.

Where the carrier is used in a cable-crane for transporting a load from one point to another, such automatic adjustment of the cable is of material importance, as it preserves the same inclination of the cable to a horizontal line where the load is moving near the abutments, and the expenditure of great power is thus avoided, which would otherwise be required with a comparatively slack cable, which would produce a very great inclination at the abutments if the latter were rigid.

A construction for operating a cable-crane over all points within a circular area is shown in Figs. 3 and 4, B′ representing a stationary abutment and D′ the sheers erected upon a moving platform-car O. Such platform is shown mounted, by suitable trucks with wheels o′, upon a circular track P, the inner rail of the track being considerably elevated to resist the inward thrust of the sheers.

The carrier H is represented with a seat L for the operator, and the hoisting-ropes c are shown connected with a dumping-bucket p. An ordinary railway-track Q is shown outside the circular track P and provided with an ordinary dirt-car q beneath the sheers D′. The inclination of the sheer-poles permits the bucket p or any other load carried by the ropes c to be moved between the sheer-poles and placed upon or over the track Q. For excavating a reservoir or other large area the abutment B′ would be erected in the center of the area and the track P extended around its entire periphery. Guy-ropes T (of which a part only is shown in Figs. 3 and 4) would be extended from the abutment B′ to suitable points to resist the cable strain upon a certain arc of the track P, and such guy-ropes could be changed when it was required to operate upon another arc.

A railroad-track could be extended to different sides of the area to receive the dumpage from the carrier, or the carrier when set above the sheer-poles, as shown in Fig. 1, could discharge its load into wagons or carts of any description. A portable engine s and boiler t with dynamo u for generating the electric current,
17 and gearing to drive the car O upon the track P, may be mounted upon the platform of such car, and the car may thus be adapted to traverse the track P while carrying a load upon the cable to shift the load to any desired point. The load may thus be taken up at one point of the area and delivered to another part or discharged to a track located at one side, as shown in Fig. 4. The shifting of the tension devices can be effected by this means, as the weight G maintains the tension of the cable during any variation in the location of the load.

The entire apparatus may be readily constructed to be taken down with facility at the close of a given piece of work, and all the parts of the sheers and other apparatus constituting the gravity-anchor may be packed upon such car for transportation to any desired place.

The abutment B′ supported by the guy-ropes T constitutes a stationary support for one end of the suspended cable, while the sheers D′ constitute a support which is movable concentric with such abutment, its tension being supported by the guy-rope operating upon the opposite side of the abutment from the sheers.

Although the abutment B′ is stationary, it may be made portable, and is shown in Figs. 3 and 4 of the drawings with a pyramidal framing and with sills B^2 set upon the ground to support the vertical strain. A cap b^4 (illustrated by an enlarged section in Fig. 5^a) is shown pivoted upon the top of the pyramidal frame and formed with an eye to engage the cable and the guy-ropes, and adapted to turn upon the support as the position of the ropes is varied. Such a stationary support would, in practice, be tenoned at the intersection b^2 of the horizontal and vertical joints and secured when in use by bolts, so that its parts may be separated and packed upon the car with the parts of the gravity-anchor, the whole constituting a plant for excavating by the methods described above. Owing to the inclined position of the sheers, it necessarily stands intermediate to the cable and the weight G, the cable being approximately horizontal and attached to the sheers at an acute angle, while the weight G hangs vertically below its point of attachment upon the opposite side of the sheers. Owing to the inclination of the sheers, the bottom of the sheers necessarily projects toward the fixed support, the tension of the cable, by the operation of the gravity-anchor, being converted into a thrust toward such fixed support. Such thrust may obviously be increased, with the same amount of weight G, by diminishing the angle between the cable and the sheers and approximating the latter more closely to a horizontal line.

The operation of the tension device in automatically taking up the slack of a suspended cable, when the load approaches the supports, enables me to move the load much closer to the supports, with the same degree of power, than has heretofore been possible. Where the cable-supports are rigidly fixed, the inclination of the cable adjacent to the support is materially increased when the load approaches such support, and the power required to propel the carrier up such inclined portion toward the support is four or five times greater than is necessary to move the load over other portions of the cable.

By the use of my automatic tension device the angle of the cable is kept nearly the same throughout the movement of the load toward the supports, and the angle adjacent to the support, when the
18 load is at such point, is no greater than when the load is in the middle of the cable. The same degree of power which is capable of transporting the load at other points is therefore able to move it close to the supports. By transporting the load close to the

supports at both ends of the cable I am enabled to utilize the entire length of the cable with a moderate exertion of power, which has not heretofore been possible.

It is obvious that the guide-arm e (shown projected from the boat J. in Fig. 1) might be similarly attached to any load suspended from the carrier by the cords c, and the load may thus be guided in like manner and kept from swaying, or twisting the cords, when lowered thereby.

The guide-poles upon the carrier and upon the load may be duplicated if desired by projecting them from opposite sides of the carrier and from opposite sides of the load, and having cords f operating upon both guides in the manner already described.

Having thus set forth the nature of my invention, what I claim herein is—

1. The combination, with a suspended cable, a carrier to support a load movably upon the cable and means for propelling the carrier thereon, of a stationary support or anchor at one end of the cable, and a gravity anchor at the opposite end of the cable, consisting of an inclined sheers with the cable attached thereto, and a weight hung permanently from the sheers upon the opposite side to the cable, as and for the purpose set forth.

2. The combination, with a suspended cable, a carrier to support a load movably upon the cable and means for propelling the carrier thereon, of a fixed anchor at one end of the cable, and a gravity anchor at the opposite end of the cable, consisting of inclined sheer-poles braced toward one another and united at the top, and a weight hung permanently from the sheers upon the opposite side to the cable, as and for the purpose set forth.

3. The combination, with a suspended cable, a carrier to support a load movably upon the cable and means for propelling the carrier thereon, of a fixed anchor at one end of the cable, and inclined sheer-poles held movably at the base so as to yield with variations of load upon the cable, with the cable attached to the top of said sheers, and a weight hung permanently from the sheers upon the opposite side to the cable, as and for the purpose set forth.

4. The combination, with a suspended cable, of a fixed support at one end of the same, a track concentric with the fixed support, a car upon the track, inclined sheers attached to the outer end of the cable and supported upon the car, and a weight attached to the sheers upon the opposite side from the cable, the sheers, weight and car forming a gravity anchor movable about the fixed support, the whole arranged and operated substantially as herein set forth.

5. The combination, with a suspended cable, of a stationary support at one end of the same, and a movable gravity anchor at the opposite end of the same, consisting of an inclined sheers with the cable attached thereto at an acute angle, and a weight attached to the sheers upon the opposite side from the cable, means for moving the base of the sheers about the fixed support, and a guy-rope for

bracing the stationary support upon the side opposite to the sheers, substantially as herein set forth.

19 6. A portable plant for excavating, consisting of a cable, a portable stationary support as B′, a movable gravity anchor for the opposite end of the cable, consisting of inclined sheer poles and a weight or weight pan attached thereto as set forth, and a car fitted to the base of the sheer pole for use upon a circular track, and adapted when required to contain the stationary support and the parts of the gravity anchor and to transport them together when packed thereon, substantially as herein set forth.

7. The means for guiding the load from a suspended carrier, consisting of the combination with the cable A and the carrier H, of the arm d having wheel d′ fitted to the cable, the arm e projected from one end of the load beneath the arm d, and a cord connecting the arms, as and for the purpose set forth.

8. The means for guiding the load from a suspended carrier, consisting of the combination with the cable A and the carrier H, of the arm d having wheel d′ fitted to the cable, the arm e projected from one end of the load beneath the arm d, one or more cords c suspending the load from the carrier with a drum to wind up the same, the cord f extended over pulley g upon the arm d, and a drum upon the carrier to wind up said cord simultaneously with the cord c as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM F. BROTHERS.

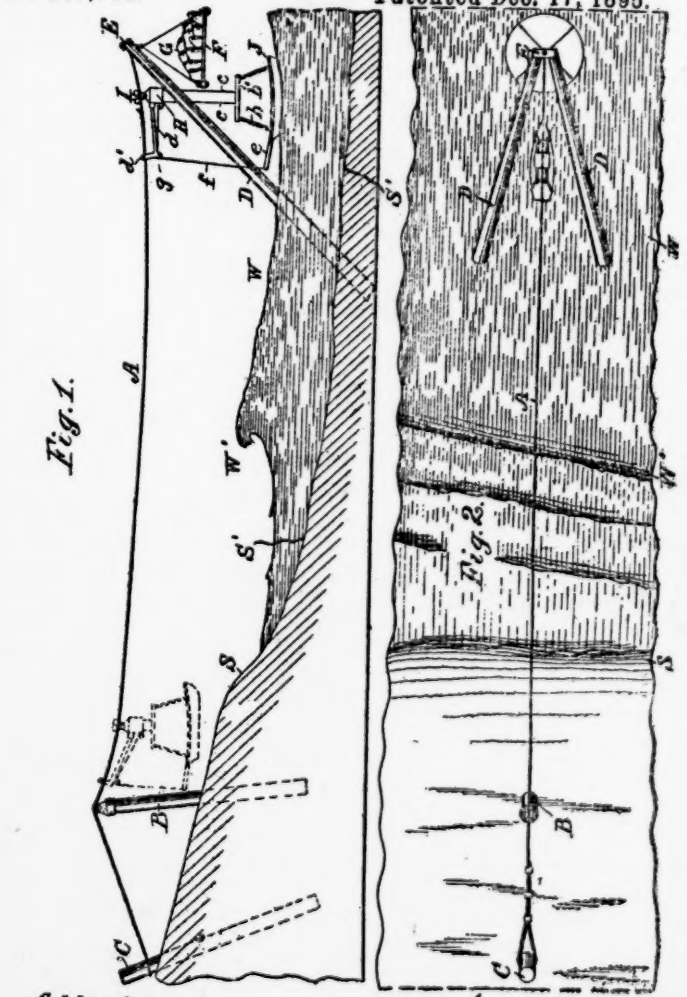
Witnesses:
L. LEE,
THOMAS S. CRANE.

(No Model.) 3 Sheets—Sheet 1.

W. F. BROTHERS.

CABLE CRANE WITH GRAVITY ANCHOR.

No. 551,614. Patented Dec. 17, 1895.



Attest:
L. Love
Edw. F. Kinsey

Inventor
William F. Brothers,
per Thomas L. Crane Atty.

21

(No Model.) 3 Sheets—Sheet 2.

W. F. BROTHERS.

CABLE CRANE WITH GRAVITY ANCHOR.

No. 551,614. Patented Dec. 17, 1895.

Fig. 3.

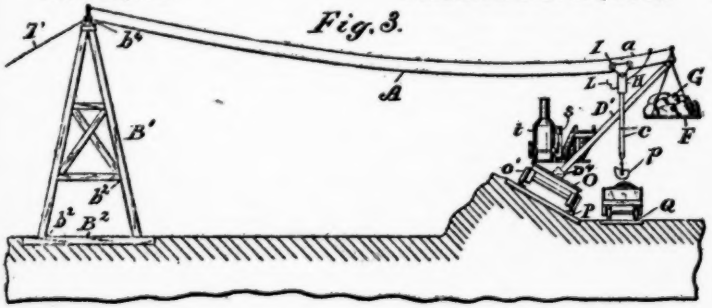
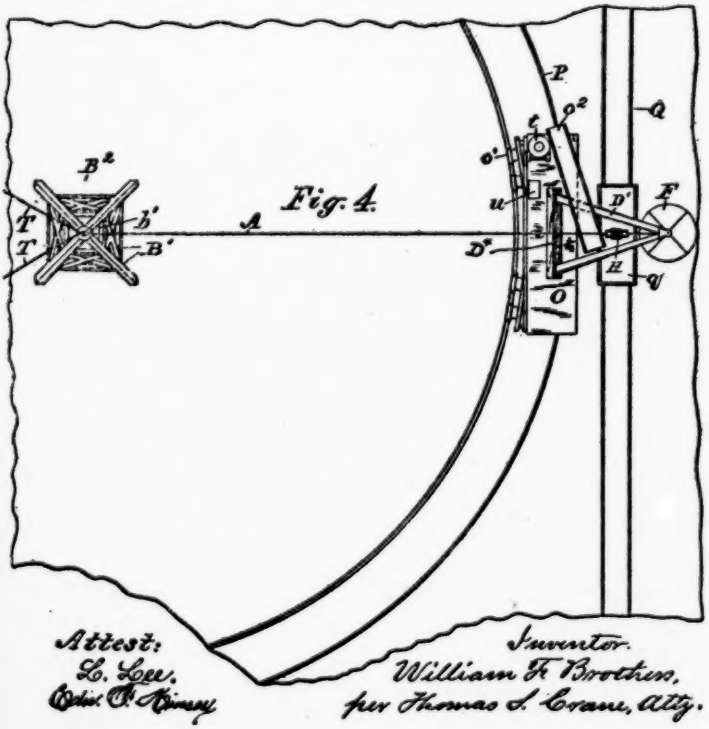


Fig. 4.



Attest:
L. Lee.
Edw. C. Kinsey

Inventor.
William F. Brothers,
per Thomas L. Crane, Atty.

(No Model.) 3 Sheets—Sheet 3.

W. F. BROTHERS.

CABLE CRANE WITH GRAVITY ANCHOR.

No. 551,614. Patented Dec. 17, 1895.

Fig. 5.

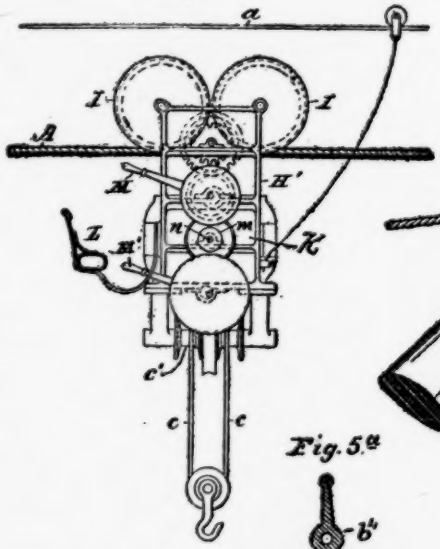
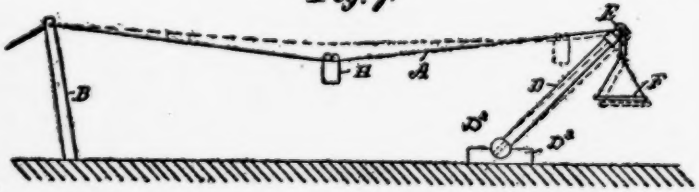


Fig. 6.

Fig. 5ª

Fig. 7.

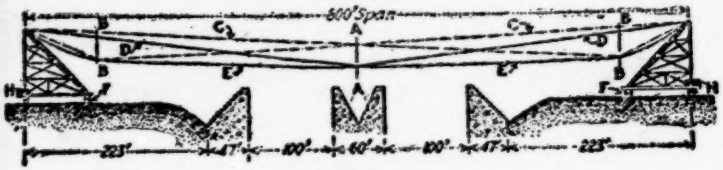


Attest:
L. Law.
Edwin C. Kinsey

Inventor.
William F. Brothers,
per Thomas S. Crane, Atty

23

"A"



"B"

24 V. *Judgment of the court.*

At a Court of Claims held in the City of Washington on the fourteenth day of June, 1917, judgment was ordered to be entered as follows:

The court, upon due consideration of the premises find in favor of the defendants and do order, adjudge, and decree that the claimant, William F. Brothers, as aforesaid, shall not have and recover any sum in this action of and from the defendants, the United States, and that the claimant's petition be and it hereby is dismissed: And it is further ordered, adjudged, and decreed that the defendants shall have and recover of and from the claimant, William F. Brothers, as aforesaid, the sum of eight hundred and ninety-three dollars and seventy-five cents ($893.75), the cost of printing the record in this cause in this court, to be collected by the clerk as provided by law.

By the Court.

25 VI. *Petition for Appeal.—Filed September 8, 1917.*

I now come in my own behalf, believing that I have been aggrieved by the findings of facts and decision of this court in the above entitled cause, made June 14th, 1917, and with respect to the conclusions of law and judgment granted in favor of the United States, against me, and I hereby appeal from said findings of facts, decision, conclusion, and judgment to the Supreme Court of the United States, for the reasons specified in the assignment of errors which is filed herein, and I pray that this appeal may be allowed and that the transcript of the record, proceedings, and papers upon which said findings of fact, decision, conclusion, and judgment were based, and in accordance with the rules and requirements in such cases provided, may be sent from this court to the Supreme Court of the United States.

William F. Brothers.

26 VII. *Assignment of Errors.—Filed September 8, 1917.*

I now come in my own behalf as appellant in the above-entitled cause, and present herewith the following assignment of errors upon which my appeal to this court is based:

1. The Court of Claims erred in its findings of fact which are against the weight of evidence.

2. The Court of Claims erred in holding as a conclusion of law upon its findings of facts that there was no infringement by the United States of my patent No. 551614, granted December 17th, 1895.

3. The Court of Claims erred in failing to hold as a conclusion of law upon its findings of facts that the United States infringed my patent No. 551614, granted December 17, 1895.

4. The Court of Claims erred in rendering judgment in favor of the United States against me, in the sum of $893.75, for the cost of printing the record.

5. The Court of Claims erred in failing to render judgment in my favor against the United States.

Very respectfully,

WILLIAM F. BROTHERS.

27 VIII. *Opinion Per Curiam.—Filed October 29, 1917.*

Per Curiam:

The plaintiff filed an application for appeal to the Supreme Court from the judgment of this court rendered on the 14th day of June, 1917. Accompanying his application for appeal are certain assignments of error and an affidavit. The defendants move to strike the said application or motion from the files, assigning several reasons. The plaintiff replies to defendants' motion to strike, and files an affidavit which relates to his financial inability to prosecute his appeal. A point made by defendants in their motion to strike plaintiff's application or motion for appeal is that the affidavit which accompanies plaintiff's application contains scandalous and impertinent statements and matters, and should be stricken for that reason. We think that ground is well taken, and the affidavit attached to plaintiff's application or motion for appeal filed September 8, 1917, is ordered to be stricken from the files in this case and shall not form a part of the record on appeal.

The application for appeal will be allowed. The court is of opinion that plaintiff's affidavit filed herein on the 1st day of October, 1917, shows sufficient cause for allowing his appeal to be prosecuted by him in forma pauperis, and the court is unwilling to certify that the said appeal is not taken in good faith.

An order will be made allowing the prosecution of said appeal in forma pauperis so far as this court may grant such privilege under the provision of the act of July 20, 1892, 27 Stats., 252, as amended by the act of June 25, 1910, 36 Stats., 866.

28 IX. *Order of court allowing claimant's application for appeal and striking from files affidavit filed Sept. 8, 1917.—Filed October 29, 1917.*

It is ordered by the court that the application of the plaintiff, William F. Brothers, for an appeal in said cause from the judgment of this court dismissing his petition be and the same is hereby al-

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lowed, and the court authorizes the prosecution of said appeal in forma pauperis by the said plaintiff.

It is ordered that the affidavit accompanying plaintiff's application, filed September 8, 1917, be stricken from the files in said cause.

By THE COURT.

29 In the Court of Claims.

WILLIAM F. BROTHERS, vs. THE UNITED STATES. } No. 33072.

I, Saml. A. Putman, chief clerk Court of Claims, certify that the foregoing are true transcripts of the pleadings in the above-entitled cause; of the findings of fact and conclusion of law and appendix filed by the court; of the opinion of the court; of the judgment of the court; of the claimant's application for appeal; of the assignment of errors; of the opinion per curiam; of the order of court allowing appeal and striking affidavit from the files.

In testimony whereof I have hereunto set my hand and affixed the seal of said court at Washington City this seventh day of November, A. D., 1917.

[SEAL.]

SAML. A. PUTMAN,
Chief Clerk, Court of Claims.

(Indorsed:) Office of the Clerk, Supreme Court U. S. Received Nov. 13, 1917.

(Indorsement on cover:) File No. 26,245, Court of Claims. Term No. 309. William F. Brothers, Appellant, vs. The United States. Filed November 30th, 1917. File No. 26,245.

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Supreme Court of the United States

WILLIAM FRANKLIN BROTHERS, Plaintiff-Appellant, *against* UNITED STATES, Defendant-Appellee.	No. 778. October Term, 1917.

BRIEF FOR PLAINTIFF-APPELLANT, IN PERSON.

Statement.

May It Please the Court:

This cause comes from the Court of Claims. A suit was instituted to recover for the use by the United States of cableway structures employed in the construction of the Panama Canal in infringement of Patent No. 551,614, granted to this plaintiff on December 17, 1895.

This plaintiff first brought suit at law in the United States District Court for the Southern District of New York against the parties who fabricated the infringing structures for the Government. These parties operated under the name of the Lidgerwood Manufacturing Company, to which company was awarded the contract for constructing and installing the apparatus. The jury in said action, **after being directed to find for the defendant**, disagreed. Notwithstanding the disagreement of the jury, the Trial Judge directed

that a verdict be entered in favor of the defendant, with the result that this plaintiff carried the case to the United States Circuit Court of Appeals for the Second Circuit, March Term, 1915. The decision of that Court is found in 223 Federal Reporter, page 359, the opinion being by **Lacombe,** Circuit Judge.

In the decision of the Court of Appeals for the Second Circuit, occurs the following:

> "If plaintiff's patent be a valid one, with claims covering broadly a tilting tower in which a gravity anchor alternately yields and overcomes load—as we think it is—and it be further shown that the user of the Panama structure so used it as to infringe the patent, a suit could be maintained against such user, if a private party. Since it is the Government, relief could be obtained only in such way as the statutes may provide; **but it must be assumed that the owner of a meritorious invention which the Government has appropriated** without his consent **will be in some way compensated,** if he can prove his case by satisfactory proof" (line 7, p. 365, Fed., 223).

In accordance with this suggestion by the Court of Appeals, the present suit was instituted in the Court of Claims through attorneys for plaintiff.

From the conclusion of law of the Court of Claims that

> "there was no infringement of claimant's patent"

and the consequent dismissal of plaintiff's petition with $897 costs for government painting, this appeal has been prosecuted to this Court.

Not being learned in the law this appellant prays the indulgence of the Court in presenting this appeal and in the observations which he herein sets forth regarding a situation the facts and the mechanics of which this appellant is thoroughly familiar.

The Case.

The conclusion of law reached by the Court of Claims that there was no infringement of claimant's patent seems to be based, as appellant conceives it, upon two erroneous propositions, namely:

First.—That the Government did not **"intend"** to infringe, and

Second.—That if infringement occurred it was not when **"title"** to the patent in suit rested in claimant and that any transfer to claimant of title to the patent which carries with it the right to sue for or recover for the past infringement of the patent, is void under Section 3477 of the Revised Statutes.

Appellant submits that these conclusions are not only unsupported by the facts, but are unwarranted, wholly erroneous, inequitable, and contrary to the law, and not in harmony with justice.

The Patent in Suit.

A copy of the patent in suit, including the specifications and drawings, appears in the appendix to the findings of the Court of Claims.

As pointed out by the Circuit Court of Appeals for the Second Circuit, when it considered the patent in suit commencing at page 361 of 223 Fed. Rep., the Brothers patent is for an improvement in

cable cranes with gravity anchors. The drawings forming part of the patent make clear the nature of the invention.

The object of the invention, as stated in the specifications, is to facilitate the erection and operation of a suspension cable, and consists in

> "combining a tension weight upon the end of the cable with an inclined shears or post adapted to transform the vertical tension of the weight into a horizontal tension upon the cable. * * * By inclining the shear poles and weighting their upper ends the tension of the cable is converted into a thrust at the lower ends of the shears; but I have termed the device a **"gravity anchor"** as it depends for its efficiency entirely upon the operation of gravity."

In the drawings of the patent reference letter A designates the cable, D the inclined shear poles or post, H the load in the carrier which travels along the cable, and F a weight hung from the side opposite the cable. The patent points out that preferably the shears are set at an angle of 45° to the cable. The statement of a preference in this regard, obviously does not exclude the use of other angles of inclination. The patent says elsewhere they are set at an acute angle. The patent points out that,

> "with the shear posts set at this angle, the weight of the poles, if permitted to yield, exerts a very material tension upon the cable **independently of the tension weight,** and the latter may be proportioned to produce the additional tension required to strain the cable in the required degree. * * * It is well known that the tension at the ends of a suspending cable is much greater with a given load at the middle of the cable than when the load is close to either abutment, and my im-

proved anchorage varies the angle of the cable in proportion to the load, **if the sheer poles be so made as to support the load and also yield under variations of the tension."**

Figure 7 of the drawings is described as illustrating in diagrammatic form the changes of angle, and it clearly shows it of both the tower and cable.

"the parts being indicated in solid lines with the load in the middle of the cable, and in dotted lines with the load close to the shear poles. In the latter position the slack of the cable is partially taken up by the tension weight and the shear poles are bent outwardly from the fixed abutment, thus holding the cable at a smaller angle with its abutment than would be the case if the shear poles were rigidly fixed and the slack of the cable were unchanged during the shifting of the load. I have found that with the use of the flexible shear poles and the tension weight G the angle of the cable to the horizontal line at the cap E is substantially the same for all positions of the load, as is indicated by the parallelism of the full lines and dotted lines adjacent to the cap E."

In pointing out the practical advantages of the invention in operation, wherein the action of the tension device is automatically taking up the slack of a suspended cable as the load approaches the supports, the patent says that the arrangement

"enables me to move the load much closer to the supports with the same degree of power, than has heretofore been possible. Where the cable supports are rigidly fixed, the inclination of the cable adjacent to the support is materially increased when the load approaches such support, and the power required to propel the

carrier up such inclined portion toward the support is four or five times greater than is necessary to move the load over other portions of the cable.

"By the use of my **automatic tension device** the angle of the cable is kept nearly the same throughout the movement of the load toward the supports, and the angle adjacent to the support, when the load is in the middle of the cable. * * * By transporting the load close to the supports at both ends of the cable I am enabled to utilize the entire length of the cable with a moderate exertion of power, which has not heretofore been possible."

The advantages of the patented structure here pointed out are important and practical ones. An **"automatic tension device"** is a safety valve on the entire structure. By causing the cable to attain and maintain substantially the same angle as the load approaches a supporting tower or shear, the formation of bends or pockets in the cable is avoided, thereby greatly increasing the life of the cable and extending the load carriage travel from one end to the other of the entire span.

The above quotations from the patent give a very clear description of the Brothers patented invention, its objects, purposes and advantages. The patented arrangement provides an **anchorage tower**—whether shears, posts, or other structure is immaterial—which tilts when the apparatus is in operation and handling loads. If neither end could yield when the load is at the center of cable span, the cable exerts its greatest pull at the top of the tower. If the tower yields to that pull, the yielding movement is towards the load, but as the load moves toward either end the yielding movement reverses. As the load approaches

either end the leverage exerted upon the tower by the cable gradually reduces, the gravity anchor acting to gradually take up the slack of the cable. The purchase of the cable on the one hand, exerted at the top of the tower, tends to tilt it in one direction and is so proportioned with reference to the resisting forces, including the weight proper and the weight of the tower on the opposite side of the fulcrum, that, during operation the one or the other, that is, the purchase on the one side and the resistance weight on the other, pre-ponderates, the two are in equilibrium. Being in equilibrium the strains and stresses throughout the entire structure are static, that is, equalized. When the one or the other of the opposing forces tend to predominate there is a rocking or tilting of the tower until the preponderance is overcome and static equilibrium is again attained. With dead ends, applied loads rapidly increase all stresses. With a yielding tower, applied loads slightly decrease all stresses for the reason that in the latter an applied load decreases the resistance moments.

The Claimed Invention of the Patent in Suit.

Claims 1, 2, 3 and 4 of the patent are involved in the suit.

Claim 1 sufficiently illustrates the nature of the claimant's invention. This claim reads as follows:

> "1. The combination, with a suspended cable, a carrier to support a load movably upon the cable and means for propelling the carrier thereon, of a stationary support or anchor at one end of the cable, and a gravity anchor at the opposite end of the cable, con-

sisting of an inclined shears with the cable attached thereto, and a weight hung permanently from the shears upon the opposite side to the cable, as and for the purpose set forth."

There is thus described and claimed in the patent a cable crane employing a tower structure which is **capable** of yielding or rocking. This structure is inclined outwardly or away from the point where the work is to be done. To the upper end of the inclined structure is connected the cable which leads away from such upper end substantially in a horizontal direction making an acute angle with the inclined structure. The tension in this cable, is its own initial tension or pull, which is governed entirely by its initial set or sag due to its own weight and position. The tension is applied to the upper end of the inclined structure through a leverage depending on the angle which the cable makes with the inclined structure, that is, its height above the fulcrum point. This tension in the cable multiplied by its leverage gives the gross cable moment applied to the upper end of the tower tending to rock the structure inwardly about its lower inner end. This cable moment is resisted by the weight of the structure which weight becomes effective as a resistance because of the outward inclination of the structure **and is applied vertically downward**, hence the new coined term "**gravity anchor**." This combined downward resistance is applied through a leverage dependent upon the degree of inclination of the structure, that is, the distance from the fulcrum point to the center of gravity of the combined resistance. The effective resistance is the product of the combined weight of the structure

and of the counter-weight multiplied by this leverage. When the cable moment equals this effective resistance the whole apparatus is in equilibrium and all strains and stresses commence to reduce—in case of disturbance of the equality of the cable moment and the effective resistance due to any load applied upon the span, the structure rocks, thereby **varying the angle of the cable with the inclined structure** and hence of the leverages, and thereby automatically maintaining equilibrium and a condition of minimum strain and stress throughout the apparatus.

In other words, according to the principles of the Brothers patent the cable moment in its total maximum attainable degrees preponderates over the total maximum attainable resistance. This is the vitally important distinguishing characteristic of the Brothers invention. Since the cable moment is the product of the tension or pull of the cable multiplied by the leverage we have a condition of variable cable moment attainable, always less than the total theoretical attainable maximum. The weight of the tower structure, the weight of the counter-weight, and the lever arm through which these various resistance factors operate are all fixed and known quantities. In the operation of the apparatus they can vary only slightly. Starting out, therefore, with a maximum attainable cable moment, five or six hundred per cent. in excess of the maximum resistance, and with, in operation, the cable moment factors of load, position of load, and leverage varied without substantially varying the resistance moment, never increasing, but on the contrary, slightly decreasing, we have the tilting and gravity anchor capacity of the towers resulting from preponder-

ance of the cable moment, the one over the other, and the attainment of the benefits and advantages of appellant's invention.

Referring to the claims the very clear discussion of their verbiage, scope and construction by the Court of Appeals at page 363 of 223 Fed., is in better language and form than I could put it and I therefore content myself with quoting the language of the Court:

> "One element of the claims is a 'gravity anchor,' which the claim itself defines as consisting of 'an inclined shears with the cable attached thereto, and a weight hung permanently from the shears upon the opposite side of the cable.' Certainly the patentee should not be confined to 'shears'; a post, which he suggests in the specification, or some similar structure which will produce substantially the same result in substantially the same way, is within the range of reasonable equivalency. The weight shown in the drawings and description consists of a mass of stones or sand bags piled up in a bucket which is swung by chains from the top of the shears. The claim is certainly not avoided by the simple expedient of substituting a mass of concrete for the stones and sand and rigid rods for the chains. As shown in drawings and description, the weight always swings free at some distance above the ground. It is therefore contended that the phrase 'hung permanently' so restricts the claim that the structure complained of—even if it be conceded, which it is not, that the tower tilts,—does not infringe because the weight is sometimes in contact with the ground. The words 'hung permanently' must be given a reasonable construction in view of what the patent discloses, viz., an 'anchor' whose holding power is due to the action of

gravity, and which is raised or lowered **as it yields to a greater strain, or overcomes a lesser one.** When it is thus yielding, it is, of course, off the ground; it is also off the ground when it is taking in the slack of the cable, as the strain of the load grows less. There comes a time, however, when the strain of the load has reached its lowest limit; when there will be no more slack to take up. If at that moment its reaches the ground, it does not cease to be a gravity anchor; gravitation is giving it the power to hold, and it continues to hold at the lowest limit of opposed strain as effectually as if it were swinging five feet up in the air. **We think it is a strained construction** which would hold that an anchor which acts in this way does not infringe because at the moment when all the slack is taken up it is not swinging free, although its weight is firmly holding, against load, all the slack thus taken up."

The Prior Art.

The findings of fact of the Court of Claims refers to certain prior art citations including, among others, the French patents to Pluchet and Sassiat, and the Chicago Drainage Canal cableways which are said to be of the

> "type shown by the Pluchet and Sassiat patents."

There are no findings of the Court of Claims, either of fact or of law, with reference to the prior art other than the identifying reference to the various citations. This prior art is not discussed in the *per curiam* opinion of the Court. No attempt appears to have been made by the Court to apply the prior art citations to the Brothers

patented structure or to show anticipation or even restriction of scope of the Brothers patent.

We are therefore spared the necessity of making an analysis of the prior art citations, or of showing that they utterly fail to detract from the revolutionary and pioneer character of the Brothers invention. The same prior art was before, and was considered by, the Court of Appeals for the Second Circuit (223 Fed., 359, 363). Its language in disposing of this prior art is far better phrased than I can phrase it, and is as follows:

> "Turning now to the patents of the prior art—and they are many—it is evident that this arrangement [the Brothers patent] is broadly new; no cable crane shown in them works that way. The patentee testified that his method was revolutionary; that other engineers laughed at him when he suggested it. Before his suggestions both tower anchorages were constructed so that they would remain rigid. This rigidity was secured sometimes by one means, sometimes by another, sometimes by a combination of means. Bases were made broad, or were firmly imbedded in the ground, or the towers were anchored by chains or rods to dead-eyes set off at an angle, or the bases were clamped down, or counterpoise weights were so affixed to the towers that no load weight under which the crane was operated could lift them. The top of the tower to which the cable ran could tilt neither inwards nor outwards. Defendants' expert, referring to some of the patents [Pluchet, Sassiat], speaks of the tower **yielding** to the strain of the cable, but a reading of these patents shows this is merely the easy assumption of the expert; each patent indicates as plainly as language can that the tower is to be so secured that, in operation, it will remain rigid,

except, of course, for the minute elasticity of wood, or steel, or other materials with which it is constructed. It may be that the art sought to avoid tilting because it feared it, dreading lest a tilt might prove but the initial step to a collapse. But whatever may have been the purpose of their builders, the structures of the prior art as disclosed in its patents, were so built that they would not tilt in operation. Of course, with all of them it is quite conceivable that an overload might be applied to the middle of the cable, so great that (if the cable would stand the strain) it might tear out dead-eyes, or break connecting chains or rods, or straighten out holding clamps, or lift the counterpoise weights. But this would involve an abuse, not a use of the structure; Brothers was the first to devise a structure whose use involved constant tilting back and forth.

"Manifestly his patent is valid.

"Moreover, since the invention is broadly new, is a pioneer in the field of tilting anchorages for cable cranes. the patent is entitled to a broad construction, and the claims to a liberal application of the doctrine of equivalents."

Here we have an adjudication of a most competent court, considering not only the prior art set up in this case and identified by the findings of fact herein, but a very great mass of other so-called prior art, that notwithstanding this prior art, the patent in suit is manifestly valid and the patented arrangement broadly new, and this claimant is accorded the honorable distinction of being a pioneer, and the patent in suit a pioneer patent, and therefore entitled to that liberality of construction, and application to equivalents which the courts accord to pioneer and fundamental inventions.

Defendants' Structure.

There is no controversy as to what the Panama cableway structure consisted of.

The general type and form of these infringing cableways is illustrated in the drawings marked "A" and "B" in the appendix to the findings of the Court of Claims (see last paragraph of Clause IV of the Court's findings of fact).

It is a most remarkable fact that the drawing referred to as "A," and as illustrating the general type and form of the Panama cableways, accompanied the bid filed by this complainant in March, 1908, with the Panama Canal Commission to illustrate a type and form of an apparatus which this complainant proposed to supply to the Commission under his patent in suit. His bid was not accepted, although this complainant was the lowest bidder for the contract and had furnished the requisite bond. Notwithstanding this complainant's failure to secure the contract, we now find that one of the very drawings which he submitted with his bid, to illustrate a type of apparatus he proposed to furnished, reappears and is now used to illustrate the general type and form of the infringing apparatus.

In Section V of the "findings of fact" of the Court of Claims are set out details of the Panama cableways, and in the drawing "B" (made by the Lidgerwood Company, after the date of the award of the contract), the structural details are illustrated.

One error of fact is noted in the "findings of fact" of the Court of Claims. The "findings" say that the cables used had "a rated breaking stress

of 200 tons." The government engineer, George M. Wells, testified as follows:

> "376 Cross-question.—What was the tensile strength of the 2¼-inch cables employed in the cableways at Panama?
>
> "Answer.—Approximately 265 tons. The Trenton Iron Works gave the breaking strength of this patent lock-wire 2¼-inch cable as somewhere between, if I remember it correctly, 255 to 265 tons."

Another error of fact is noted in this "findings," as follows: The "findings" say, "The entire weight of each tower including the tower proper, the trucks upon which it was mounted, and the concrete counterweight, was upward of 500 tons." In this connection the government engineer, Wells, testified as follows:

> "398 Cross-question.—Can you give the total weight of the tail tower, including the weight of the frame structure, the weight of the counterweight, and the weight of the trucks on which the structure rests; I mean the total weight of the tail-tower structure as a structure?
>
> "Answer.—The total weight of the tail-tower as a structure, without the weight of the cables upon it, is 471,000 pounds."

This resistance weight, therefore, instead of being upwards of 500 tons (1,000,000 pounds), is only 471,000 pounds or 235½ tons. To this should be added 15,400 pounds or 17½ tons due to half of the weight of two 2¼-inch cables, making the total resistance weight of the duplex tail towers 243 tons.

The Panama cableway plant consisted of six "duplex" or double cableways, and one single

cableway, thirteen in all. In the duplex cableways two main cables 2¼" in diameter were stretched between the tops of the head and tail towers. In the single cableway only one such cable was employed. All the testimony refers only to the duplex in computations. As shown above, each cable had a tensile strength of approximately 265 tons. This means that each cable could exert a maximum pull of 265 tons before it parted or ruptured. In a duplex cableway, the two cables were capable; together, of exerting a maximum pull of 500 tons before rupturing. In addition to these two main cables there were a number of operating steel lines passing from the head to the tail tower, one of which Mr. Buckholdt (XQ138) says, had a strength of 65 tons, all of which operated on the cable moment side, of which this plaintiff, in order to avoid details, has omitted though they are far from negligible forces. It would increase the cable moment over 25% in excess of that herein shown. The height of the tower, 85 feet, represents the maximum length of the lever arm through which the pull of the cables is applied tending to rock or tilt the tower inwardly or towards the load. The product obtained by multiplying the maximum theoretical pull of the cables by the length of this lever arm through which the pull is applied to the top of the tower, that is, the product of 265 tons multiplied by 85 feet, is 22,525 foot tons, or (2,000 pounds to a ton), 45,050,000 foot pounds in the case of the single cableway. In the case of a duplex cableway employing two cables this sum is doubled or 90,100,000 foot pounds.

Now, let us see what the total maximum attainable resistance is which opposes this pull. As we have shown, the total weight of the duplex tail tower structure, including the counterweight, weight of trucks and weight of cables, is 243 tons, when no load is imposed on the cable (XQ400, Wells). The lever arm through which this aggregate resistance is applied to resist the tilting of the tower, is the distance from the front rail of the track on which the tower is supported, as the fulcrum, to the center of gravity of this aggregated downwardly acting resistance weight. This distance is given by the Government engineer Wells, as approximately 48 feet (XQ405, XQ406, Wells's deposition). (No other witness makes it so great, but I can again be liberal.) Now the product of the resistance weight by the lever, that is, the product of 243 tons by 48 feet lever arm, gives 10,364 foot tons, or (2,000 pounds to a ton), 20,728,000 foot pounds, maximum attainable resistance opposing a maximum attainable tilting force of 90,100,000 foot pounds, in the case of the duplex cableways. Calculations taking into consideration the pull of the operating wire ropes, made by one Newman Collins for the defendant Ligerwood, clearly establishes the fact that the safe factor of 500% in the main cables called for in the government invitation under which we bid (see R., commencing page 86), was secured right here though the cable moment exceeding the resistance moment or forces 500% and it was so argued by Lidgerwood in Panama, when seeking the award.

While, as we have shown, the maximum attainable force tending to turn the Panama towers, or cause them to tip inwardly, exceeded the total

maximum resistance forces, that maximum cable force is never attained in practice, because it cannot be extended beyond the resisting forces, hence, the safe factors are secured and maintained by virtue of the gravity anchor yielding to any greater force and overcoming any lesser force.

The only variable component of the resistance, which is not appreciable, is the load carried upon the cable. In the Panama cableways, therefore, we have, for all practical working purposes, a condition of substantially constant weight, weight applied through a substantially constant lever arm, on one side of the fulcrum, constituting the gravity anchor, and a cable force which is variable with varying initial sag or deflection of the cable, applied through a varying lever arm on the other side of the fulcrum. Upon the supremacy of one or the other of these two opposing forces, acting in the same structure, and about the same fulcrum, depends whether or not the towers tip, and in which direction.

The pull exerted by the cable on the tower is greater, the straighter the cable is stretched between the towers. That is, by decreasing the initial deflection of the cable the pull of the cable is increased.

It is regretted that the Court of Claims failed to make a finding of fact as to the degree of initial sag or deflection of the cables and as to the loads handled, particularly as these are vitally important factors in determining which of the forces, the cable force, or the resistance or gravity anchor force, predominates in the practical operation of the cableways. Since, as is clearly shown, the Panama cableways embody primarily the principle of an **underweight** anchor or resistance for the

towers as compared with and distinguished from an **overweighted** or "dead man" anchorage, such as those of the prior art, and since this is the fundamental and vital principle of the Brothers invention which the Court of Appeals has held to be revolutionary and pioneer, the failure of the Court of Claims to give the loads and deflections of the cables as testified to by the Government's engineers becomes a serious omission.

The fact is, however, that the specifications upon which the Panama cableways were furnished (R. p. 89) permitted a maximum cable deflection or sag of 44 feet (see bottom of p. 91) at the center of the cable when a load of 6 tons is imposed thereon at that point.

The Government engineer, Mr. Wells, in his answer to Q161, states that:

> "With a maximum total deflection of the main cable at the center of the span of approximately 44 feet, it would require approximately 19,000 pounds, 9½ tons, occurring simultaneously on each cable in the center of the span to produce the condition of zero downward pressure on the back track of the tail tower."

This testimony, I take it, means that if a load of 9½ tons is imposed simultaneously on both cables of a Panama duplex cableway at the center of the span, with a cable deflection of 44 feet loaded and 41 feet unloaded, then a condition of equilibrium would be attained and there would be no downward pressure on the outer track rails. In other words, under these conditions the cable moment would just equal the resistance of the gravity anchor and the tower would be in a condition just ready to tip with any increase of load, decrease of

initial sag, or decrease of weight of the tail tower, which after June, 1910, was lighter than the head tower. Pursuing this matter further, Mr. Wells was asked in cross examination (XQ292) if, under the same conditions of loads at the center of the span on each cable, and a deflection of the cable of 30 feet instead of 44 feet, it would require the loads to be 9½ tons to produce a condition of zero pressure on the back track of the tower, **and he admitted it would not.** He admits (XQ294) that if the deflection of the cable was only 20 feet it would require still less weight of load at the center of the cable span to bring about equilibrium, and that if the deflection was 17 feet the load required to produce equilibrium would be still less (XQ295). Upon further probe of cross examination along this line, this witness says (XQs296, 297, 298) that if a load of 9½ tons were applied simultaneously at the center of cable span to each cable with a cable deflection of 30 feet, a condition of **"minus zero downward pressure"** on the back tracks would be produced, in which case

> **"the tower would lift from the back track and rest on the wheels on the front rail of the front track."**

In other words, the cable purchase would force the resistance of the gravity anchor and it would tip. This witness was forced to admit that the effect of this tipping would be to **reduce the strain in the main cables** (XQ299). Here, then, we would have attained and realized the benefits of an automatic safety arrangement against overloading, advantages of the Brothers invention. Plainly a reduction in the strain of the main cable would reduce the stress and strain in the tower structure,

here again insuring safety factors, demanded in the Government invitation to bidders (see R., p 91).

In order to remove all shadow of doubt and reduce the matter to the certainty of mathematical demonstration, Mr. Wells, the Government witness, who qualifies as an eminent technical engineer, and amply competent to make the necessary computations, was asked to compute and determine exactly what the relative proportions of the loads would be on the front and back tracks, respectively, of the tower. He was given three of the many conditions of operation: No. 1, with a load of 9½ tons at the center of span of each cable and an initial deflection of cable of 30 feet; No. 2, six-ton load condition (see XQ353) and an initial cable deflection of 20 feet; No. 3, with a load of 6 tons at centers of cable spans and an initial cable deflection of 17 feet. The results of the computations are given in the answer to cross question 309 of the Wells deposition. Therein the witness gives the figures for the condition No. 1 as follows:

> "This condition exerts or causes to be exerted a horizontal pull at the top of the head tower of approximately 346,000 pounds. This gives us a moment about the front rail of the front truck of 29,478,000 foot pounds. Resisting this we have all the downward loads acting about the front rail of the front truck, and equal to approximately 23,937,000 foot pounds. **This shows that there is a negative downward force that may be expressed as such on the back track of approximately 117,000 pounds. In other words, this is not a condition of equilibrium, and the tower would leave the back track, would rotate toward the center of the span, throwing the entire**

downward load on the front rail. The head of the tower would move horizontally forward approximately four feet (this was subsequently changed to one foot, five inches, see answer to XQ348), **and the wheels of the back trucks would leave the rails on the back track for a vertical distance upward of approximately 2 feet 6 inches.** (This was subsequently changed in answer to XQ348 to 10½ inches.) **This would produce an approximate deflection in the center of the span of 38 feet, at which point equilibrium would result. * * *"**

With regard to the problem No. 2, wherein the load to be considered is 6 tons, but with cable initial deflection of 20 feet instead of 30, the witness, continuing his answer to XQ309, says that:

"The pull of the cables under this condition exerts a horizontal force at the top of the tower of approximately 31,212,000 pounds. This is resisted by all the downward forces in the tower acting about the same rail, giving a downward moment of 23,605,000 pounds. **This is a condition of unstable equilibrium, and the tower would leave the back track and rise on to the front wheels of the front rail of the front track. The unbalanced force, or** what is the same thing, the negative force at the back track for this condition would be 145,000 pounds. **As stated, the head of the tower would move forward until the span shortened a sufficient distance to increase the deflection from 20 feet to some greater amount where the horizontal pull just offsets the downward forces about the front rail of the front track. * * *"**

Regarding the problem No. 3 where the load to be considered is 6 tons at the center of the cable spans and the cable deflection unloaded is 17 feet, the witness, in the same answer, says:

> **"Such a condition also would lift the tower on to the front rail of the front track and would create a negative force at the back track** of 272,000 pounds. **The tower would, as in the previous cases, rotate and the head of it would move forward until the equilibrium was established."**

This testimony of the Government's own witness, the capable engineer who testifies that he prepared the plans and specifications for these cableways, and who details at length the extent and importance of his engineering experience, establishes to the degree of mathematical certainty that as installed, with a cable deflection of 44 feet it would require loads of 11½ tons occurring simultaneously at the center, to bring the tower to the point where any increase of the load beyond the 11½ tons would tip the tower. Also, that with the same span of 800 feet and a cable deflection of 30 feet and loads of 9½ tons, **the tower would tip until a condition of equilibrium is established at a cable deflection of 38 feet.** Also, that with a cable deflection of twenty feet unloaded, and loads of six tons the tower would tip until equilibrium was again established. Also, that if the deflection was seventeen feet unloaded and the loads six tons, the tower would tip until equilibrium was again established.

It is to be noted that in the computations of Mr. Wells, as to the problem No. 1, he gives the distance through which the top of the tower moves

inward as four feet (substantially changed [XQ-348] to one foot five inches), and the vertical height through which the outer or back truck wheels rise from the track rail, as two feet six inches (subsequently changed [XQ348] to ten and one-half inches). The witness, in answer to XQ346, tells us that a cable deflection of twenty feet and six-ton loads at the center of the span would cause the head of the tower to move inwardly approximately eleven inches and the rear truck wheels to rise 6½ inches. And in answer to XQ347 he tells us that with six-ton loads and seventeen feet initial cable deflection the head of the tower would move inwardly.

This means that in the handling of loads of 9½ tons by the Panama cableways complained of herein, with the cable set to a deflection of thirty feet unloaded, the towers would tip and yield thereby attaining the advantages and benefits of the Brothers patented invention. It also means that in handling six-ton loads with a cable deflection of twenty feet unloaded, the towers likewise would tip and yield in accordance with the Brothers patented invention. It also means that with six-ton loads (the normal loads handled) and a cable deflection of seventeen feet unloaded, the towers would tip and yield, and, likewise, would employ the Brothers patented invention.

Now, according to the "findings of fact" of the Court of Claims, Section VI:

> "**beginning about August, 1910, it became necessary,** in order to admit of the loads being carried to pass clear of the works and men engaged thereon as the height of the work increased, **to take up the slack** or **decrease the deflection of the cable.**

> The cables were accordingly drawn up for said purpose. This tightening up of the cables or reduction of their deflection increased the effect of the load and weight of the cables upon the towers as regards their **tendency** to yield or tilt."

Having seen that with a reduction in the cable sag the tipping of the tower occurred, and that when a tower tipped the strains are reduced as equilibrium is maintained, it is clear that by taking up the slack of the cables **commencing in "August, 1910," the apparatus was so altered** and changed as to be put into condition to utilize and take advantage of the invention which the Brothers patent secures exclusively to its owners. It will be observed that the apparatus was equipped with what is marked "rope bridle" in drawing "B" for the purpose of taking up the slack or decreasing the deflection of the cable.

Since the deflection of the cable and the loads imposed on the cable in the operation of the apparatus are both vitally important factors in mathematically determining whether or not the towers operated to attain the benefits and advantages, it is more than regrettable that the Court of Claims contented itself with merely the finding that "it **became necessary**" to take up the deflection of the cable commencing in August, 1910, and failed to make a finding as to what loads were actually handled after the slack or deflection of the cables was taken up, and as to the extent to which the cable deflection was reduced.

The evidence, however, fully establishes not only that the deflection of the cables was reduced, commencing about August, 1910, and the extent of the reduction of the deflection, but also what loads were handled.

The Government's witness, Buckholdt, who testifies that he was in charge of the operation of the Panama cableways, testifies that the deflection of the cable was reduced to 20% of the height of the towers (XQ152), that is, 20% of 85 feet, or 17 feet cable deflection, **"it would be 17 feet to be exact"** (XQ154, R., p. 127). Mr. Wells testifies that the apparatus was installed with a normal cable deflection of forty-one feet. See R., p .

With regard to the loads handled, the same witness says, in effect, that when the aparatus was installed the safety working loads handled was put at six tons. This is what the specifications for the installation required. This specified load was not exceeded at first, but later on Mr. Buckholdt says:

> "we multiplied that six by six. In other words, six hundred per cent. over in some cases" (XQs 184, 185, Buckholdt's testimony).

Many instances of excessive overloads imposed on the cableways are given in the testimony of the witnesses for the Government.

Mr. Buckholdt was asked in his direct examination and he answered as follows:

> "Q84. Was there any other occasion that you can recall where you lifted an unusual weight? A. We moved all of the locomotives out of the cut, the larger locomotives out of the cut, with the cableways, and they were all excess loads. That was the only way we had of getting them out of the locks after the locks were completed, and when they were through with the locomotives they had no further use for them in the cut."

Not so many years ago they would have dismantled them at great expense, and without the tower yielding, such must have been done.

weighed

These locomotives m 12 to 100 tons." (XQ315,

"anywhere fro on.)

Wells's deposit wer of the witness Buckholdt

Again, in the ans tails another instance where he to question 71, he de steel form which, in the lan- lifted and handled a guage of the witness ty per cent overload or more.

> "was easily six was a sixty per cent overload. At the least it form would have weighed at Yes, that steel s, and our safety working load least twelve ton hink, and that form was a col- was six tons, I orm that would easily weigh lapsible steel f t was a hundred per cent over- twelve ton, so i load."

In the answers of the witness Buckholdt to ques- tions 79 and 80, he details another occasion when he lifted a gate of greatly excessive weight, and while he says the to wer did not tilt on this occasion, it is obvious from t he mathematical calculations of Mr. Wells that it could do nothing else but tip. The incident here r ferred to by Mr. Buckholdt oc- curred in May, 191 3 (XQ393, Buckholdt's deposi- tion), and on this occasion the witness was on the head tower. I was obviously impossible for him to see or ob serve whether or not the tail tower, 800 feet aw y, tilted.

Again, the same witness (Q85, direct) refers to an occasion where he employed **one of these cableways to lif a locomotive back on its tracks, the wei ht of which was 70 tons** (XQ404). On this occasion the witness was at the locomotive and not at the tail tower at all.

The Government's witness Johnson testifies in answer to Q44, that:

> "During the whole progress of the work, cleaning up of rock and dirt just in advance of the concrete work was done with the cableways, the dirt being carried out of the cut either in skips or in the same buckets which we used to handle concrete. The cableways were also used in placing, removing and moving both wood and steel forms. * * *. Fixed steel which was imbedded in the concrete, as a part of the lock machinery and culvert gates were handled and placed in position by the cableways. Steel rails, which were used as reinforcements in some parts of the work, were handled by the cableways."

In answer to Q48, the same witness testifies as follows:

> "As I recollect, the heaviest culvert forms which we handled on the cableway were those for the center wall culvert, weighing, as I recollect, about 13 tons. The heaviest piece of cast steel, which we had to place, were parts of the Stony Gat valves. These pieces weighed, according to my recollection, 13 or 14 tons."

The reason for increasing the loads to as much as "six times six" or "600% in some instances" is clear.

Buckholdt testifies in answer to Q58 of his direct examination:

> "Why, there is not any doubt at all but that they [the cableways] handled more material then [between May 21, 1910, and August 20, 1910], than they had formerly."

And again, on cross examination:

> "XQ361. You did handle more material [in August, 1910] for the same period of time with the same apparatus, didn't you? A. Yes, sir.
>
> "XQ362. You wanted to get results, didn't you? A. Yes, sir.
>
> "XQ363. In August, 1910, and from then on? A. Yes, sir, and we always wanted results."

Thus we have here, fully established by the Government's own witnesses, that, **as found by the Court of Claims,** the deflection of the cable was reduced commencing in August, 1910, and that this was necessary; that the apparatus was installed with a deflection of 44 feet to handle six-ton loads; that this deflection was reduced to 17 feet; that the loads were vastly increased; and the reason was to increase the work accomplished—to get results. And we also have the computations of the Government's own engineer, Mr. Wells, as to what actually happens in the operation of the apparatus when the deflection of the cable is reduced, or the loads increased to the extent testified to by Buckholdt and Johnson.

This establishes beyond all peradventure that, commencing in August, 1910, when the operation of the apparatus was altered by **decreasing the deflection** of the cables, the full benefits and advantages of the Brothers' invention was attained.

Plaintiff will not burden this brief with quotations from the testimony of Messrs. George Wilson, Roy Allen and himself, all fact witnesses, who testified before the court below that they saw on repeated occasions during the years 1910, 1911 and 1912, the structures complained of tilting and rock-

ing back and forth performing the functions of the patent, but relies upon the admissions of the defendant's witnesses herein cited and quoted as ample proof that the court below has erred in its findings and judgment.

Intention Does Not Control Infringement.

According to Section VII of the findings of fact of the Court of Claims

> "there is no satisfactory evidence that the towers either yielded or tilted at any time **during the period of claimant's ownership of said letters patent.**"

In this connection the Court finds (Section III) that **"title"** to the patent was acquired by claimant on October 2, 1912. Therefore, when the Court says that there is no satisfactory evidence that the towers yielded or tilted at any time during claimant's ownership of the patent, they plainly mean that there is no satisfactory evidence of yielding or tilting of the towers during the period from October 2, 1912, the date patent title passed from plaintiff's company and agents back to plaintiff, to December 17, 1912, the date when the patent expired. This very curiously and significantly leaves open the question of tilting for the period commencing about August, 1910, when, as found to be the fact, **"it became necessary"** "to take up the slack or decrease the deflection of the cable," which tightening up of the cables or decrease of their deflection **"increased the effect of the load and weight of the cables upon the towers as regards their tendency to yield or tilt."** It is unfortunate that during claimant's ownership of the patent,

they plainly mean that there is no satisfactory evidence of yielding or tilting of the towers during the period from October, 2, 1912, to December 17, 1912, the date when the patent expired. This very curiously and significantly leaves open the question of tilting for the period commencing about August, 1910, when, as found to be the fact, **"it became necessary"** "to take up the slack or decrease the deflection of the cable," which tightening up of the cables or decrease of their deflection **"increased the effect of the load and weight of the cables upon the towers as regards their tendency to yield or tilt."** It is unfortunate that the Court failed to make a finding on this important matter, particularly in view of the overwhelming and uncontraverted evidence of the tilting of the towers during the period commencing about August, 1910. Indeed, the witnesses and skillful engineers testifying for the defendant, as we have seen, were forced to admit that during this period, and under the loads handled and with the reduced cable deflections employed, the forces brought into play compelled the towers to tilt, and that their destruction, or the destruction of the cables, would have resulted if they had not tilted.

The Court, however, finds that it was the **intention and purpose** of the engineer **officers** of the Canal Commission that the towers should not yield or tilt. This raises the question whether a defendant can be held as an infringer of a patent when he has no intention or purpose to infringe but still attains and enjoys all the benefits and advantages of the patented invention.

It is not the **"intention"** that controls, but what actually took place.

It is found as a fact in this case that the deflection of the cable was reduced and that this reduction of deflection **"became necessary,"** and that by reason thereof the tendency of the towers to tilt was increased. By the reduction of the cable deflection the apparatus was put in a condition where in the normal, easiest and most effective manner of its use the towers tilted, and in tilting relieved the stresses and strains throughout the system. The situation is thus presented of a cableway mechanism the towers of which may or may not tilt according to whether the cable deflection is sufficiently increased or decreased. In other words, the cableways used by the defendant would infringe the patent in suit or would not infringe said patent according to whether the cables were left slack, or were tightened up, their deflection reduced. It makes no difference what the intention was. The fact remains that by taking up the cable slack and reducing the cable deflection all the benefits and advantages of the patented invention were secured and enjoyed. The strains were relieved, the life of the cables extended, and a vastly greater quantity of work was accomplished, and with greater safety than had been accomplished before.

The Circuit Court of Appeals for the Second Circuit had a somewhat similar situation before it in the case of Parsons Non-Skid Co. *v.* Atlas Chain Co., 198 Fed. Rep., 399, where the Court considered a patent for a non-skid device for rubber tired vehicle wheels the feature of which was a series of chain links or the like "fitting loosely over the periphery of the wheel," and which was "free to move or shift its position around the periphery"

of the wheel. The Court, referring to the defendant's device, which was claimed to infringe, found that it

> "may be so adjusted that the chains are held loosely, and if the driver of the car becomes satisfied that the best results can only be attained by a loose adjustment, it is more than probable that he will adopt that method. In other words, the defendant places in the hands of the chauffeur an apparatus which may infringe or not, according to whether it is wound up loosely or tightly. Should it appear that the best results can be obtained only by a loose adjustment, it is hardly probable that a chauffeur will take the additional time and trouble to secure an inferior result. If experience shows that a loose adjustment prevents skidding and saves the wear and tear of the tires, it is safe to assume that it will be adopted, notwithstanding directions to the contrary. When the defendant sells a device the natural, usual and preferential use of which constitutes an infringement, it is no answer to assert that it is possible, by limiting its efficiency, to use innocently."

The same Court, in Marconi *v.* De Forest, 225 Fed. Rep., 373, affirmed the District Court for the Southern District of New York (225 Fed. Rep., 65), wherein it is said:

> "A reading of the affidavit submitted leaves me in no doubt that defendant Radio Company sold and delivered to the Standard Oil Company on board certain of its vessel a signaling apparatus which, when put together and used in the normal way, the easiest way, and the most effective way, would infringe both the patents in suit. The whole defense amounts to this, viz.: That defendant can take, and has taken, an infringing set of apparatus,

> and so arranged or co-ordinated it as to avoid infringing. * * * It seems to me that it would be (under familiar cases) proper to grant a preliminary injunction here on the sole ground that the apparatus vended and used by the defendants was capable of infringing, and would when ordinarily used by operators be so adjusted as to infringe."

These cases from which the above quotations are given are referred to in Walker on Patents, Fifth Edition, page 457, as authority for the proposition that the charge of infringement is not averted by showing that the structure may be and occasionally is used in good faith in a manner that would not infringe if it would infringe when used in the normal, easiest and most effective way. If this is sound then it would be still less an avoidance of infringement where a change in the structure or operation, such as the taking up of slack of the cable or reducing its deflection, in the Panama cableway without increasing the weight of the concrete is necessary to the practical, safe and successful operation of the apparatus, especially where such change increases the natural tendency of the apparatus to operate on the principle of the claimed invention of the patent in suit, and to perform the same function.

Infringement Is Clear.

In the case of Machine Co. *v.* Murphy, 97 U. S., 120, 125, this Court considered a patent for a paper bag blank cutting machine in which the blank was cut by means of a cutting device which was reciprocated vertically in the performance of its work as the blank material was progressed past it. The infringing machine employed a sta-

tionary knife, the blank material being progressed over it, the severing of the bag blanks being effected by a bar which struck the blank material and pressed it against the stationary knife. In holding the defendant's machine to be an infringement of the patent there considered, this Court said:

> "Except where form is of the essence of the invention, it has but little weight in the decision of such an issue, the correct rule being that, in determining the question of infringement, the Court or jury, as the case may be, are not to judge about similarities or differences by the names of things, but are to look at the machines or their several devices or elements in the light of what they do, or what office they perform, and how they perform it, and to find that one thing is substantially the same as another, if it performs substantially the same function in substantially the same way to obtain the same result, always bearing in mind that devices in a patented machine are different in the sense of the patent law when they perform different functions or in a different way, or produce a substantially different result."

Judge Nelson, in Blanchend *v.* Beers, 2 Blatch. 416, states:

> "The sure test, and one the jury should be guided by in all cases of this kind, is whether or not the defendant's machine, whatever may be its form or mechanical construction, has incorporated within it the principle, or the combination, or the novel ideas which constitute the improvement to be found in the plaintiff's machine. If it does, then, no matter what may be its mechanical construction

or its form, it is an infringement, an appropriation of the ideas of another, simply in a different form."

When a party has invented some mode of carrying into effect a law of natural science or a rule of practice, it is the application of that law or rule which constitutes the peculiar feature of the invention, and is entitled to protect himself from all other modes of making the same application; and every question of infringement will present the question, whether the different mode, be it better or worse, is in substance an application of the same principle.

Sewall *v.* Jones, 91 U. S., 171, 184; 23 L. Ed., 275.

If the plan of the defendant's machine is in substance and effect a colorable evasion of the patentee's contrivances, it is an infringement. If the defendant takes the same general plan and applies it for the same purpose, although he may have varied the mode of construction, it will be substantially, and in the eye of the patent law, the same thing.

Seymour *v.* McCormick, 2 Blatch., 240; 16 How., 480.

It is a well settled principle of law that the mere change in the form of the machinery (unless a particular form is specified as the means by which the effect described is produced) or an alteration in some of its essential parts, or in the use of known equivalents, powers, not varying essentially the machine or its mode of operation or organization, will not make the new machine

a new invention. It may be an improvement upon the former, but that will not justify its use without the consent of the first patentee.

O'Reilly *v.* Morse, 15 How., 62; 14 L. Ed., 601.

It is of no consequence, in respect to the question of infringement, whether one machine is like or unlike the other in respect to its costs, adjustability, or other peculiarity of construction, provided that, notwithstanding such difference, the one is, in its mechanical action, operation and effect, the same as the other.

Foss *v.* Herbert, 2 Fish, 31; 1 Biss., 121, Fed. Cases 4,957, Judge Drummond.

A patentee is not confined to the precise arrangement in the construction of his machine which he has described in his patent. Formal changes are nothing; mere mechanical changes are nothing; all these may be made outside of the description to be found in the patent, and yet the machine after it has been thus changed in its construction is still the machine of the patentee because it contains his invention, the fruits of his mind, and embodies the discovery which he has brought into existence and put into practical operation.

Leroy *v.* Latham, 2 Blatch., 474; 14 How., 156.

It is a familiar rule that to copy the principle or mode of operation described in the patent is an infringement, although such copy should be totally unlike the original in form or proportions.

If it were not so, no question of infringement could arise. If the machine complained of were a copy in form of the machine described in the specification, it would be at once seen to be an infringement. It could be nothing else. It is only ingenious diversities of form and proportion, presenting the appearance of something unlike the thing patented, which give rise to questions.

Winans *v.* Denmead, 15 How., 330.

"Where the machines are substantially the same and operate in the same manner to produce the same result, they must be in principle the same. The same result must be understood to mean the same kind of result, though there may be a difference in extent. The result is the same according to this definition whether one produces more than another or not, if the operation is to make the same article."

Gray *v.* James, Pet. C. C., 394;
Imlay *v.* Railroad Co., 1 Fish, 340; 4 Blatch., 227.

If the result is the same in kind it is not necessary that it shall be the same in degree.

Whipple *v.* Middlesex Co., 4 Fish, 41.

An infringer cannot evade liability for his infringement by deliberately diminishing its utility without changing materially its form, its chief function, or its manner of operation.

Sewing Mach. Co. *v.* Frame, 24 Fed., 596.

In Syracuse Chilled Plow Co. *v.* Leroy Plow Co., 233 Fed., 684, Judge Hazel in the District Court of Western District of New York, states:

"It makes no difference that defendant does

> not adapt its construction to attain all the benefits of the patent in suit. It has all the means to attain the result, and presumably it was its intention to operate the plow in the same way as complainants' operated."

Identity exists with reference to the question of infringement, if the idea of means protected by the patent is found substantially existing in the invention practiced by the alleged infringer.

> Robinson on Patents, Vol. 3, Par. 892;
> Lourie Implement Co. *v.* Lenhart *et al.*, 130 Fed., 122 C. C. A.;
> Columbia Wire Co. *v.* Kokomo Steel & Wire Co., 43 Fed., 116 C. C. A.

A device whcih is constructed on the same principle as that of a patent, has the same mode of operation, and accomplishes the same result by the same or equivalent mechanical means, infringes the patent, although it may differ in form.

> American Caramel Co. *v.* Glen Rock Stamping Co., 201 Fed., 363 D. C. M. D., Penn.

In Knight *v.* Gavit, Fed. Cas., No. 7,884, the Court said:

> "The question is, not whether the two machines are identical in form, or whether they are equally perfect in their adaptation to use. It is the commonest of all devices with those who seek to defraud a patentee, to give a novel exterior to their piracy, to modify forms, introduce new parts or omit old ones, to change the position of the parts, and generally to mask their violations of the patent right as best they may. * * * Courts and juries look through the artifice of dress to the essential

> substance and decide by reference to the substance alone. This is the law in regard to combinations of machinery, as well as those which may be, in common language, spoken of as simple inventions."

The rules announced in the above cited authorities are universally followed. These rules place the determination of the issue of infringement upon the machines themselves or their several devices and elements, what they do, what office or function they perform, and how they perform that function. This rule necessarily excludes the **intention** of the infringer. It makes no difference what the **intention** may have been. It is **infringement** of the patent grant that is involved whatever may have been the **intention.** If, therefore, when the slack of the cables in the Panama cableways was taken up and their normal deflection decreased, or the loads handled increased, or a combination of both, the cableways thereafter performed substantially the same function in substantially the same way to obtain the same result, as pointed out and claimed in the patent in suit, then the above stated rule applies and the Panama cableway became substantially the same as the patented cableway of the patent in suit. That the Panama cableways, after taking up the slack in the cables or reducing their deflection, or increasing the loads handled, did perform substantially the same function as the patented device, and in substantially the same way, and accomplished the same results, is established by the evidence beyond all peradventure of dispute. The tendency of the cables at the tops of the towers, as they were in the Panama

structures when hanging idle in their normal catenary of deflection, was to exert at the tops of the towers a strain or pull in a direction to cause the towers to tip or tilt inwardly towards the cut of the canal. This tendency existed potentially in the apparatus as installed. This tendency was resisted by the counterweight including all its component forces. The pulling or turning strains increased vastly with decrease of the deflection of the cable, and with increase of loads, and preponderated over the forces resisting them, under the specific conditions of cable deflection and loads on the cable resulting from taking up the cable or decreasing the cable deflection and increasing the loads. This preponderance of the tower tilting strains or forces over the resistance forces resulted in tipping or tilting the towers until the relative leverages through which the tilting forces and the resisting forces were exerted became equalized, thereby producing a static condition in the structure and relieving it of excessive strains. This, it will be observed, is exactly the function of the apparatus pointed out in the patent in suit, and is exactly the manner in which that function is obtained according to the directions of the patent, and is exactly the result which the patent sets forth. It cannot be successfully challenged, therefore, that whatever may have been the **desire** or the **"intention"** of the **"engineer officers"** in charge of the operations of the Panama structure, the fact remains that, looking at the mode of operation of that structure as it was actually employed after taking up the slack of the cable (after decreasing its deflection), and looking at the way it worked, and the results it accomplished, as well

as the means employed in performing that work and accomplishing its results, that structure became, in the sense of the patent law, substantially the same thing as that of the patent in suit. As this Court pointed out in Machine Co. *v.* Murphy, *supra*, at page 125:

> "Authorities concur that the substantial equivalent of a thing, in the sense of the patent law, is the same as the thing itself; so that if two devices do the same work in substantially the same way and accomplish substantially the same result, they are the same even though they differ in name, form or shape. Curtis, Patents (4th Ed.), Sec. 310."

That one may not have **intended** to commit a wrong does not acquit him if he actually commits the wrong, seems too clear to the lay mind as to require no further argument to support it. The **intention** to do or not to do a thing, is merely a state or quality of the mind. This is not controlling where the thing is done or not done contrary to what is alleged to be the intention. The intention certainly ought to be subordinate to and controlled by the law and not the law by the intention.

In the case of infringement of copyrights it has been repeatedly held by the courts that when the infringement is once established, the question of intent or purpose is immaterial.

Morrison *v.* Pettibone, 87 Fed. Rep., 330;
Fishel *v.* Lueckel, 53 Fed. Rep., 449;
Harper *v.* Shappell, 26 Fed. Rep., 519;
Reed *v.* Halliday, 19 Fed. Rep., 325;
Lawrence *v.* Dana, 15 Fed. Cases, No. 8, 136;
Millett *v.* Snowden, 17 Fed. Cases, No. 9, 600;

Parker *v.* Hume, 18 Fed. Cases, No. 10, 740;
Scott *v.* Stanford, L. R., 3 Eq., 718;
Kelly *v.* Warris, L. R., 1 Eq., 697.

Evidence of innocent intention may have a bearing on the question of "fair use" of a copyright but it cannot be admitted as a defense where it appears that the party setting it up has invaded a copyright.

Lawrence *v.* Dana, *supra.*

Even ignorance on the part of the infringer of the existence of a copyright owned by another will not protect the infringer against the consequences of his infringement of the copyright.

Millett *v.* Snowden, *supra;*
Lee *v.* Simpson, 3 C. B., 871.

In the law of trade marks it is well settled that infringement will be restrained irrespective of the question of intention on the part of the defendant.

Saxlehner *v.* Siegel-Cooper, 179 U. S., 42;
Amoskeag *v.* Trainer, 101 U. S., 51;
McLean *v.* Fleming, 96 U. S., 245;
Hutchinson *v.* Loewy, 163 Fed. Rep., 42;
Consolidated Ice Co. *v.* Hygeia, 151 Fed. Rep., 10.

And in the patent laws to constitute an infringement of a patent it is not necessary that the infringer should have known of the existence of the patent at the time he infringed it. In such a case there clearly could be no intention to infringe or to avoid infringement. Where, however, as in the present case, the Government knew of the claimant's patent, and the officers in charge of the

Panama Canal work had claimant's patent specifically brought to their attention, which is the fact here, and knew of the rights secured to its owner by said patent, the allegation of intention to avoid infringement of said patent must be given no weight in the face of the fact that the invention of the patent was appreciated and used by the Government. It was not necessary that the infringer here, with knowledge of claimant's patent **believed** that it was not infringing, or that the Panama cableways avoided infringement.

These principles are established by the cases:

U. S. *v.* Berdan Fire Arms Co., 156 U. S., 566;
Parker *v.* Huhne, 1 Fisher, 54;
Norton *v.* Automatic Can Co., 57 Fed Rep., 933;
Parker *v.* Haworth, 4 McLean, 373;
Matthews *v.* Skates, 1 Fisher, 608;
National Car Brake *v.* Mfg. Co., 19 Fed, Rep.. 520;
Royer *v.* Coupe ,29 Fed. Rep., 361;
Bate Refrigerating Co. *v.* Gillett, 31 Fed. Rep., 815.

Section 3477 of the Revised Statutes Has No Application in This Case.

Section 3477 of the Revised Statutes re-enacts an Act of Congress entitled, "An Act to Prevent Frauds upon the Treasury of the United States," Act of February, 1853, 10, Statutes at Large, 170, and declares that all transfers and assignments of any claim upon the United States or of any part or share thereof, or interest therein, whatever may be the consideration, and all powers of attorney or

orders or other authorities for receiving payment of any such claim, or any part or share thereof, shall be absolutely null and void unless the same shall be freely made and executed in the presence of at least two attesting witnesses after the allowance of such claim, the ascertainment of the amount due, and the issuing of a warrant for the payment thereof. These are the terms which the Court of Claims has applied to the transfers of title of this appellant's patent.

Under Section 4898 of the Revised Statutes, every patent, or any interest therein, shall be assignable in law by an instrument in writing which is rendered void against any subsequent purchaser or mortgagee for a valuable consideration without notice unless it is recorded in the Patent Office within three months from the date thereof. It has been held by this Court in the case of Lewis Moore *v.* James Marsh, P. Beaver, Charles C. Shorkley and Elisha Shorkley, see 7 Wallace, 515-523, 19 L. Ed., page 37, that the assignment of a patent does not carry with it a transfer of the right to damages for an infringement committed before such assignment. The same principle is applied in the decision of the Circuit Court for the District of Maryland in the case of Jones *v.* Berger, 58 Fed. Rep., 1006, wherein it is said:

> "The rule is that to pass the right to sue for past infringement words must be used in the assignment which expressly transfer to the assignee the right of action. Moore *v.* Marsh, 7 Wall., 515; Emerson *v.* Hubbard, 34 Fed. Rep., 327; Walk. Pat., Sec. 277; 2 Rob. Pat., Sections 781, 942."

Since these decisions the practice and custom in transferring the title to patents is to include a state-

ment giving to the assignee the right to sue for and collect damages for the past infringement of the patent transferred. The assignments or deeds of transfer of title to appellant's patent in this cause, and under which the title was transferred through various trustees, eventually returning back to appellant, contain this clause giving to the assignee in each instance the right to sue for and collect damages for past infringement.

According to Clause VI of the findings of fact of the Court of Claims, "beginning about August, 1910, it became necessary to take up the slack or decrease the deflection of the cables employed in the Panama cableways. This tightening up of the the cables or reduction of the deflection **increased the effect of the load and weight of the cables upon the towers as regards their tendency to yield or tilt.**" This constitutes the infringement complained of. The infringement, therefore, commenced according to the findings of fact of the Court of Claims, about August, 1910. At that time title to the patent in suit was in the Balanced Cable Crane Co., Inc., a corporation of Maine, according to Clause III of the findings of fact, which corporation acquired its title by deed of assignment dated September 21, 1906. The Balanced Cable Crane Company became a bankrupt and the patent in sait, was, on February 7, 1911, sold and conveyed by the Trustee in Bankruptcy to one George Doan. This transfer took place **after** the commencement of the infringment. On February 27, 1912, while the infringement was continuing, Doan transferred title to the patent in suit to one Konigsberg, who in turn, on October 2, 1912, and while the infringement was continuing,

transferred title to the patent in suit to this complainant. The patent expired by limitation of its term, on December 17, 1912. As above stated, each of the transfers or deeds of assignment of the title to the patent in suit carried **specifically** a transfer also of the right to sue for past infringement of the patent.

The question is whether or not these various transfers of the title to the patent in suit, coupled with a transfer of the right to sue for past infringement of the patent, constitutes such a transfer or assignment of a claim against the United States as is contemplated by Section 3477 of the Revised Statutes.

This Court has had occasion in many cases to consider, construe and apply the provisions of this statute, but I am unable, after a diligent search, to find any case in this Court, or in any other court, where a deed of assignment of title to a patent for an invention containing a provision giving the assignee the right to sue for past infringement of the patent, has been held void under Section 3477 of the Revised Statutes. It is confidently asserted that no authority of law nor of reason or common sense can be found for holding such a transfer of title to a patent as coming within the intendment of the statute. The closest parallel to this situation which I have been able to find is the case of Freedman's Savings & Trust Co., *et al. v.* Alexander R. Shepherd, *et al.*, reported in 127 U. S. 494; 32 L. Ed. 163, where this Court considered a pledge of a demand against the United States for use and occupation of prem-

ises leased to the United States, as security for a debt. In the pledge instrument it was

> "covenanted and agreed that any draft or check issued in payment or part payment of said claim shall be endorsed and delivered to the trustee named in said trust, and the proceeds thereof, less all proper costs and charges, be applied to the payment of the said indebtedness, with interest as aforesaid, or to so much thereof as the sum or sums of money so received is or are sufficient to pay."

This Court refused to accept the view that this pledge was void under the statute in question.

It seems to this appellant that there is far more reason to hold that a pledge of rental payment to be made by the United States for the use and occupation of premises under a lease, with directions to apply such rental payments in discharge of the indebtedness for which said payments are pledged, is in contravention of the statute (Sec. 3477) than is the assignment of title to a patent. The rulings of this Court in other cases where this section of the statute has been considered show clearly that it is

> "not to be interpreted according to the literal acceptation of the words used"

and that

> "there may be assignments or transfers of claims against the government * * * which are not forbidden"

by it.

> Bailey *v.* United States, 109 U. S. 432; 27 L. Ed. 988, 990.

This Court has pointed out the mischief designed to be remedied by the statute in question to be:

1. The danger that the rights of the Government might be embarrassed by having to deal with several persons instead of one, and by the introduction of a party who was a stranger to the original transaction.

2. That by a transfer of such a claim against the Government to one or more persons not originally interested in it, the way might be conveniently opened to such improper influences in prosecuting the claim before the departments, the courts, or the Congress, as desperate cases, where the reward is contingent on success, so often suggest.

Goodman *v.* Niblack, 102 U. S. 556;
Bailey *v.* United States, 109 U. S. 432.

Indeed this Court has repeatedly held that the object of Congress as expressed in Section 3477 R. S., and in the Act of 1853, which preceded it, was to protect the Government and to prevent frauds upon the Treasury.

Bailey *v.* U. S., 109 U. S. 432;
Hobbs *v.* McLean, 117 U. S. 567;
Freedman's Savings Co. *v.* Shepherd, 127 U. S. 494;
Price *v.* Forest, 173 U. S. 410, 423.

The title of the Act of 1853, "An Act to Prevent Frauds Upon the Treasury of the United States," indicates its nature and purpose.

As further indicating the purpose of the Act,

this Court, at its first term after the passage of the Act of 1853, said,

> "this Act annuls all champertous contracts with agents of private claims."
>
> Marshall *v.* Baltimore & Ohio R. R., 16 How., 314, 336.

In United States *v.* Gillis, 95 U. S., 407, this Court considered the validity of a voluntary transfer of the legal title to a claim under the Abandoned and Captured Property Act of March 12, 1863, for the proceeds of certain cotton seized by the military forces of the United States. The suit was brought in the Court of Claims by the transferee of the claim. The Court of Claims found in favor of the claimant. This Court reversed and directed the dismissal of the suit in view of Section 3477, R. S. In that case this Court, while holding that the Act of 1853, from which Section 3477, R. S., was taken, was of universal application and covered all claims against the United States in every tribunal in which they might be asserted, distinctly called attention to the fact that

> "there are devolutions of title by force of law, without any act of parties, or involuntary assignments compelled by law,"

to which the statute did not apply.

In the case of Erwin *v.* United States, 97 U. S., 392, 397, this Court, speaking of the Act of 1853, said that it applied only to cases of **voluntary assignment of demands against the government**, and that

> "It does not embrace cases where there has been a transfer of title by operation of law.

> The passing of claims to heirs, devisees or assignees in bankruptcy are not within the evil at which the statute aimed."

In Goodman *v.* Niblack, 102 U. S., 556, the Act of 1853 was under consideration. A person had made an assignment for the benefit of his creditors, which included all his rights, effects, credits and property of every description. This Court held that the assignment, although it covered whatever might be due him under a contract with the United States for the transportation of the mails, was not within the prohibition of the Act of 1853. This Court in so holding, say:

> "In what respect does the voluntary assignment for the benefit of his creditors, which is made by an insolvent debtor, **of all his effects,** which must, if it be honest, include a claim against the government, differ from the assignment which is made in bankruptcy? * * * We cannot believe that such a meritorious act as this comes within the evil which Congress sought to suppress by the Act of 1853."

In the case of Hobbs *v.* McLean, 117 U. S., 564, this Court had before it a partnership agreement under which a government contract which one of the partners hoped to get was to be fulfilled. The validity of the articles of partnership was questioned in view of the provisions of Section 3477, R. S. This Court held that it was obvious this statute did not apply. The Court says:

> "Section 3477, it is clear, only refers to claims against the United States which can be presented by the claimant to some department or officer of the United States for payment, or may be prosecuted in the Court of Claims.

> The section simply forbids the assignment of such claims before their allowance, the ascertainment of the amount due thereon, and the issue of a warrant for their payment."

In the case of Yorke *v.* Conde, 147 N. Y., 486, the Court of Appeals of New York in considering the application of Section 3477, R. S., to an assignment of a claim for money against the United States as security or payment for materials purchased in creating the claim, reached the conclusion that, as construed by this Court, the section of the Statute referred to permitted transfers made in the legitimate course of business, in good faith, to secure an honest debt.

This conclusion was affirmed by this Court in Conde *v.* Yorke, 168 U. S., 642.

This doctrine is followed in

> Coates *v.* U. S., 53 Fed. Rep., 989, C. C. A.;
> Dulaney *v.* Scudder, 94 Fed. Rep., 4 C. C. A.

It will be observed that in the cases of Erwin *v.* United States, 97 U. S. 392, 397, and of Goodman *v.* Niblack, 102 U. S. 556, above referred to, a transfer or assignment in bankruptcy is held not to be included within the provisions of the statute under consideration. Under these rulings the passing of title to the patent in suit from the trustee in bankruptcy of the Balanced Cable Crane Company to Doan on February 11, 1911, after the infringement complained of commenced, could not be affected by the statute even if title to the patent, together with the right to sue for and collect damages for the past infringement of the patent, constitutes a claim against the Government.

Under this state of the law and facts, the question is whether or not the transfer of title to a patent for an invention, together with the right to sue for and collect damages for the past infringement of the patent, constitutes a claim against the Government, in case the Government is an infringer of the patent, of such character as to be prescribed by that section of the statute, No. 3477, under discussion.

It will be immediately noted that the assignment of patents and interests therein are required by Section 4898 to be in writing and to be recorded in the Patent Office. When this is done one reason for the Statute 3477 disappears, in that thereafter the Government as well as all the rest of the world is put on notice as to who is owner of the patent and of the rights under it. Therefore, in the present case there is no danger of the Government being embarrassed by having to deal with unauthorized parties (Bailey *v.* United States, *supra*). Moreover, instead of creating a situation in which the way might be opened up for the use of improper influences in prosecuting the infringement, which is one of the mischiefs the statute is designed to remedy, the recording of deeds of transfer of title to and interests in the patent in suit, as required by statute, effectually prevents just such a contingency. (Goodman *v.* Niblack, *supra*.) Instead of presenting an evil at which the statute is aimed, namely, the perpetration of frauds upon the Treasury, the recording of an assignment of title to a patent for an invention under statutory authority and requirement prevents any such evil.

It is submitted, therefore, that the transfers of title to the patent in suit in this case are not as-

signments or transfers of claims against the Government such as are contemplated by Section 3477 of the Revised Statutes. It is inconceivable that the Government shall require assignments and transfers of a patent to be in writing and recorded in one section of the statutes, and then take advantage of such assignments or transfers to defeat an action for its infringement of the patent.

In view of these considerations it is earnestly contended that Section 3477 of the Revised Statutes has no application in this case.

CONCLUSION.

Commencing in August, 1910, after the date of the Act of June, 1910, giving the Court of Claims jurisdiction in patent infringement ditigations, the Panama cableways were put in infringing condition, and thereafter utilized and employed the invention of the Brothers' patent.

The fact that the Panama cableways, in the operation thereof after being put in infringing condition in August, 1910, actually employed the Brothers' patented invention offsets any intention to avoid infringement.

A transfer of title to the patent in suit, coupled with a right to sue and collect for past infringement, is not such a transfer as is prescribed by Section 3477 of the Revised Statutes.

The judgment of the Court of Claims should be reversed and the Court directed to enter a judgment for this claimant.

Respectfully submitted,

WILLIAM F. BROTHERS,
In Person.

In the Supreme Court of the United States.

OCTOBER TERM, 1918.

WILLIAM F. BROTHERS, APPELLANT,
v.
THE UNITED STATES.
No. 309.

APPEAL FROM THE COURT OF CLAIMS.

BRIEF FOR THE UNITED STATES.

The appellant sued for damages for the infringement of a patent on "improvements in cable cranes with gravity anchors," claiming that the United States had infringed the patent during the construction of the Panama Canal. The Court of Claims found against him and dismissed his suit.

STATEMENT OF THE CASE.

The appellant applied for his patent in 1895, and it was granted December 17 of that year to his assignees. It was subsequently assigned a number of times, and finally was reassigned to the appellant on February 27, 1912, just two and a half months before it expired.

The claim is that this patent was infringed by certain cableways used by the Government in the

construction of the Panama Canal, beginning in 1909 and continuing until the expiration of the patent. The cableways alleged to be infringements were constructed in 1909, and were in use by the Government on June 25, 1910, when the act was passed permitting suits in the Court of Claims against the United States for infringement of patents. The alleged infringement consists in the use of tilting or yielding towers. The Court of Claims has found that—

> Subsequent to the construction and installation of said cableways they were maintained and operated without change in structural form or method of operation other than that as the height of the walls and other work of the canal increased, beginning about August, 1910, it became necessary, in order to admit of the loads being carried to pass clear of the works and men engaged thereon as the height of the work increased, to take up the slack or decrease the deflection of the cable. The cables were accordingly drawn up for said purpose. This tightening up of the cables or reduction of their deflection increased the effect of the load and weight of the cables upon the towers as regards their tendency to yield or tilt.

And also:

> It was the intent and purpose of the engineer officers of the Canal Commission, by and under whom said cableways were designed, constructed, and operated, that the towers thereof should be rigid and nonyielding to the full

extent that rigidity in cable towers was possible; and there was no tilting or yielding of said towers other than such as resulted from a yielding of the roadbed of the tracks supporting them, portions of which roadbed consisted of "fills" of excavated materials upon swampy ground. There is no satisfactory evidence that the towers either yielded or tilted at any time during the period of claimant's ownership of said letters patent.

BRIEF.

I.

RIGHT TO RECOVERY LIMITED TO TWO AND ONE-HALF MONTHS.

Since the appellant was not the owner of the patent when the cableways were constructed and only for two and one-half months during the time that they were used, his right to recovery would in any event be limited to a recovery for the use of his patent during this two and one-half months, for the reason that there could be no assignment of any claim against the Government to him arising prior to the time he became the owner of the patent. (Sec. 3477, Revised Statutes.)

II.

NO RIGHT TO RECOVERY FOR USE OF CABLEWAYS IN USE BY THE GOVERNMENT IN 1910.

As stated above, the cableways in question were constructed in 1909, and were thereafter in continuous use by the Government. The right of appellant to sue for an infringement of his patent rests

wholly upon the act of June 25, 1910 (36 Stat., 851), which gave permission to sue the United States on such claims. But that act contains this proviso:

> *Provided, however,* That said Court of Claims shall not entertain a suit or reward compensation under the provisions of this act where the claim for compensation is based on the use by the United States of any article heretofore owned, leased, used by, or in the possession of the United States.

It follows, of course, that the United States has not consented to be sued for using the cableways which it was using when this act was passed, and nothing more appearing, it would be clear that appellant had no standing in court.

III.

NO INFRINGEMENT BY CHANGES IN CABLEWAYS AFTER 1910.

The appellant's only claim, therefore, rests upon the allegation that after the passage of the act above referred to such changes were made by the Government in its cableways as to amount to an infringement of the patent in question. This, of course, involves an admission that as originally constructed the cableways did not infringe. If the Government was infringing the patent when the act of 1910 was passed, it could continue to infringe it without being subject to suit.

Appellant, then, can recover only on the theory that the original construction of the cableways did

not infringe, but that afterwards the infringement occurred through a change in the cableways. Whether such changes did occur or not must now be determined from the facts which appellant has brought here in the shape of findings of fact by the Court of Claims.

The two paragraphs quoted above from the findings of fact contain every fact found by the court relating in the remotest degree to changes occurring after the passage of the act of 1910. Unless something can be found in them which establishes the alleged infringement, the appeal must fail. The question, then, is, do the facts found show that after the passage of the act of 1910, and during the two and one-half months that appellant owned the patent, the Government infringed that patent by using tilting or yielding towers? The Court of Claims has found that the purpose was to make these towers as rigid and nonyielding as was possible, and that there was no tilting or yielding of the towers other than such as resulted from the yielding of the roadbed of the tracks supporting the towers at places where these tracks rested on foundations not as firm as they might be. This in itself would be conclusive against any claim that yielding or tilting towers were used. But with respect to the time during which appellant owned the patent the court is even more explicit and finds that there is no satisfactory evidence that the towers either yielded or tilted at any time during that period.

IV.

It is respectfully submitted that the above findings are conclusive against the appellant, and the judgment of the Court of Claims should be affirmed.

WILLIAM L. FRIERSON,
Assistant Attorney General.

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BROTHERS *v.* UNITED STATES.

APPEAL FROM THE COURT OF CLAIMS.

No. 309. Argued March 28, 1919.—Decided May 19, 1919.

An unliquidated claim against the United States, under the Act of June 25, 1910, c. 423, 36 Stat. 851, for the alleged infringement of a patent is not assignable with the patent. Rev. Stats., § 3477. P. 89.

The essential feature of patent No. 551,614, granted to Sarah E. Brothers et al. for "improvements in cable cranes with gravity anchors," is a non-yielding support or anchor at one end of the cable, and a yielding, tilting, or rocking support at the opposite end, consisting of outwardly inclined shears or some equivalent structure held movably at the base, and a counterweight on the outer side. *Id.*

This patent was not infringed by the use of cableways supported by two towers both of which were intended and constructed to be rigid, but both of which, upon the tightening of the cables, done for the purpose of enabling the loads to clear the work as its height increased, acquired a tendency to yield with the yielding of the railroad bed beneath them, under the increased stress. P. 93.

Findings of the Court of Claims are to be treated like the verdict of a jury, and this court is not at liberty to refer to the evidence, any more than to the opinion, for the purpose of eking out, controlling or modifying their scope. *Id.*

52 Ct. Clms. 462, affirmed.

THE case is stated in the opinion.

Mr. William F. Brothers pro se.

Mr. Assistant Attorney General Frierson, for the United States, submitted.

MR. JUSTICE PITNEY delivered the opinion of the court.

Appellant brought this action in the Court of Claims under the Act of June 25, 1910, c. 423, 36 Stat. 851, to recover compensation for the unlicensed use by the United States in the Panama Canal work of his patented invention for "Improvements in cable cranes with gravity anchors." That court made findings of fact upon which it concluded as matter of law that there was no infringement of claimant's patent, and thereupon dismissed his petition. 52 Ct. Clms. 462.

From the findings it appears that claimant filed application for his patent July 18, 1895, and, upon such application, letters patent No. 551,614 were granted and issued, under date December 17, 1895, to his assignees Sarah E. Brothers and Maria A. Brown, to whom he had made assignment pending the application. Subsequently the letters patent were assigned to claimant, under date October 2, 1912, two and one-half months prior to their expiration by limitation on December 17, 1912. His claim to compensation is necessarily limited to this brief period, since there could be no assignment to him of any unliquidated claim against the Government arising prior to the time he became the owner of the patent. Rev. Stats., § 3477.

No question is made but that plaintiff's invention was broadly new, a pioneer in its line, and the patent entitled to a broad construction and the claims to a liberal application of the doctrine of equivalents. (See *Brothers* v. *Lidgerwood Mfg. Co.*, 223 Fed. Rep. 359.) It relates to the method of erecting and operating a suspension

cable adapted to carrying a traveling crane or the like. Roughly speaking, the prior art consisted in supporting such cables upon rigid and unyielding towers at each end, so as to prevent an undue sagging of the cable under the strain of its load. Claimant's invention consisted in employing a rigid support or abutment at one end of the cable and what is called a "gravity anchor" at the opposite end, consisting of outwardly inclined shears with the cable attached thereto and a weight hung permanently from the shears on the opposite side, which weight, together with the weight of the shears, puts a tension upon the cable varying according to the weight of the structure and counterweight, combined with the degree of inclination of the structure; the operation of the tension device being automatically to take up the slack of the suspended cable when the load approaches the supports, with the result of permitting the load to be moved closer to the supports, with a given exertion of power, than before. There are other advantages not necessary to be specified. The essential feature of the patent is a non-yielding support or anchor at one end of the cable, and a yielding, tilting, or rocking support at the opposite end, consisting of outwardly inclined shears or some equivalent structure held movably at the base, and a counterweight on the outer side. It is to be observed that rigidity of the head tower is a *sine qua non*, necessary to produce tension of the cable; yielding supports at both ends would be a contradiction of terms, since with such an arrangement there would be no support, and the entire structure would collapse under its own weight. The importance of this will appear.

In the construction of the Panama Canal the Government installed in the year 1909, and maintained and used continuously thereafter until the expiration of the Brothers patent, one single cableway and six duplex or double cableways which are complained of in this case

as infringements. As to the mode of construction, maintenance, and operation of these cableways, the findings of the Court of Claims are as follows:

"The single and the duplex cableways were similar in general design and construction except that the towers of the former supported a single cable, while those of the latter supported two cables, parallel to each other, at a distance of 18 feet apart, and each operated independently of the other, the length of the towers longitudinally of the canal cut being of proportionate dimension for the accommodation of the two cables. The towers were of structural steel construction; and taking the duplex cableways for illustration, each tower in vertical cross section from front to rear was in the shape of a right-angle triangle, with a base of approximately 50 feet, a perpendicular or vertical height of about 85 feet, and a hypothenuse of about 98 feet, with a length of about 38 feet longitudinally of the canal. The two towers of the cableway stood facing each other, on opposite banks of the canal cut, with their hypothenuse faces toward the cut. The cable span across the cut between the tops of the towers was approximately 800 feet. The cables used were 2¼-inch steel-wire cables having a rated breaking stress of 200 tons. The cables were supported by headblocks or saddles at the tops of the towers, and their ends were carried down and firmly anchored to the counterweighted bases of the towers.

"Rigidity of the towers was desired; and in order to secure this and hold the towers rigid against any tendency to tip, tilt, or yield under the stress of the suspended cables and their loads, the platform base at the rear side of each tower—that is, the side farthest from the canal cut—was counterweighted by a block of cement concrete of over 150 tons weight, cast about the structural steel members of the base of the tower and extending along practically the entire length of the base. The entire

weight of each tower, including the tower proper, the trucks upon which it was mounted, and the concrete counterweight, was upward of 500 tons.

"To facilitate the shifting or moving of the cableways along the canal cut as the work progressed each tower was mounted upon sets of trucks, similar to the trucks of railway cars, on the front and rear sides of the base of the tower, and the whole structure was mounted upon two standard-gauge railway tracks located on the bank of the canal cut at the proper distance from each other and from the similar tower tracks on the opposite bank of the cut.

"The cableways were operated by electrical power from the machinery stations in the head tower of each cableway.

"Subsequent to the construction and installation of said cableways they were maintained and operated without change in structural form or method of operation other than that as the height of the walls and other work of the canal increased, beginning about August, 1910, it became necessary, in order to admit of the loads being carried to pass clear of the works and men engaged thereon as the height of the work increased, to take up the slack or decrease the deflection of the cable. The cables were accordingly drawn up for said purpose. This tightening up of the cables or reduction of their deflection increased the effect of the load and weight of the cables upon the towers as regards their tendency to yield or tilt.

"It was the intent and purpose of the engineer officers of the Canal Commission, by and under whom said cableways were designed, constructed, and operated, that the towers thereof should be rigid and nonyielding to the full extent that rigidity in cable towers was possible; and there was no tilting or yielding of said towers other than such as resulted from a yielding of the roadbed of the tracks supporting them, portions of which roadbed con-

sisted of 'fills' of excavated materials upon swampy ground. There is no satisfactory evidence that the towers either yielded or tilted at any time during the period of claimant's ownership of said letters patent."

Upon the argument here, appellant quoted somewhat amply from the evidence taken before the Court of Claims. For the purposes of our review the findings of that court are to be treated like the verdict of a jury, and we are not at liberty to refer to the evidence, any more than to the opinion, for the purpose of eking out, controlling, or modifying their scope. *United States* v. *Smith*, 94 U. S. 214, 218; *Stone* v. *United States*, 164 U. S. 380, 382; *District of Columbia* v. *Barnes*, 197 U. S. 146, 150; *Crocker* v. *United States*, 240 U. S. 74, 78, and cases cited.

We concur in the opinion of the Court of Claims that no infringement of claimant's patent is shown. In the Act of June 25, 1910, under which this suit is brought and under which alone it could be brought, it is expressly provided that there shall be no such suit "based on the use by the United States of any article heretofore owned, leased, used by, or in the possession of the United States." In view of this and of the fact that the cableways complained of were theretofore in the possession of and used by the United States, claimant insists that after the passage of the act the Government materially altered the cableways in such a manner as to make them infringe his patent. The contention is that the cables were tightened up in order to decrease their deflection, and that this tightening, in view of the loads carried by the cables, caused the supporting towers to yield or tilt, and thus to become in essence movable towers like the gravity anchors covered by the claimant's patent. But, as pointed out by the Court of Claims, it is beyond question that, as constructed and used generally, and as intended to be used, the Government cableways did not infringe claimant's device. The subsequent tightening of the cables was done

in the orderly conduct of the work for the purpose of carrying the loads over and free from the work that was being constructed. So far as this caused a yielding of the tower under the stress of the load, it was an incidental result, affecting or tending to affect the towers on both sides, and not upon one side to the exclusion of the other. It did not amount to a mechanical equivalent of the claimant's structure; there is no semblance of an outward inclination of a yielding tower or yielding support, but rather a tendency on the part of rigid towers to break down or collapse inwardly under an undue stress. And, as we have shown, the rigidity of one support is as essential to claimant's structure as is the movability of the other.

Inasmuch as the findings fully support the judgment of the court below, its judgment must be and it is

Affirmed.